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## Rubber Compounding Practice<sup>1</sup>

*Softeners Are Essential in the Development and Processing of Modern Compounds  
Every Softener Functions in Distinctive and Beneficial Ways*

WEBSTER NORRIS

**S**TOCK uniformity, smoothness, plasticity and tack in a rubber mixing are properties which determine the economy and facility with which it can be mixed, calendered, tubed, molded and otherwise processed. While softness and adhesiveness are thus essential, they should not be overdone by the employment of materials that introduce technical difficulties in processing or impair rather than enhance the serviceability of the cured product.

Stocks in which the volume of the plastic mass is large in proportion to the compounding powders present, do not require softeners other than the natural resins present in the rubber. Hard and soft gums are frequently blended to secure ease of processing as well as cheapness. Even at that a softener may be added, especially in the case of frictions to be calendered at high speed. There is much difference in the ease with which dry compounding ingredients will mix with rubber. In general, those of relatively coarse particle size, such as barytes, whiting, and other powders prepared by grinding, mix in readily when used in moderate amounts. Powders of extremely minute particle size, like hard and soft carbon blacks, possess so much surface tension, or intermolecular stored energy, that they refuse to disperse freely in the rubber mass without assistance. Their particles naturally hold together in groups or aggregates instead of separating fully and making individual contacts with the rubber or, in other words, becoming wetted by it and blending as a uniform mix.

Because of these conditions it is often necessary to use rubber softeners as compounding aids. Several types of softeners are in common use. Their emollient action and wetting effect are essential features of their function as aids to dispersion in mixing with minimum expenditure of power.

While a few softeners are emollients only, most of them are of special value in their influence on the finished product, such as stabilizing cure, producing tack, improving cure, tensile properties and aging quality.

Practically all of the softeners here listed and described are used with advantage in current compounding practice for the manufacture of tires and mechanical rubber goods. M R is not included in this list, although some compounders consider it a softener. In practice it is commonly associated with reclaims. Both these materials should be regarded as adjuncts for cheapening crude rubber rather than softeners or substitutes for it. Regarding reclaims it should be noted that they act most effectively to disperse carbon black in a rubber mixing. This effect may be due to the presence

of resinous materials common to reclaim and the shearing action it exerts on the mill.

Softeners may be separated into groups as follows: Vegetable, animal and mineral oils or greases; so-called rubber fluxes; fatty acids; resins, tars, pitches and waxes.

### Asphaltic Fluxes

Asphaltic fluxes are very efficient softeners. They mill readily into crude rubber or reclaim, adding tackiness to the stock in both the hot and cold condition and favorably influence processing, tensile properties and aging quality. They are especially esteemed for mechanical goods, heels and many cheap molded articles, also in tire treads and other goods for abrasive wear service.

B. R. H. No. 2 is an asphaltic oil flux favored for its marked adhesive quality, especially for tape friction and as a general softener for average mechanical factory compounding purposes.

Flux oil is the residual oil after the gasoline, paint thinners, etc., have been removed from crude oil. This product from mid-continental, California and Mexican petroleum is of asphaltic origin and very sticky. It is used as a road surface binder because of this quality. Its gravity is about 1.06 to 1.08. It is the base of mineral rubber and has sometimes been called liquid rubber. Its chief usefulness is as a softener and binder in mechanical molded goods stocks, frictions for tape and cheap hose, and rubber products containing principally inferior reclaim or otherwise over-compounded.

Para flux is a saturated liquid hydrocarbon obtained from asphaltic flux oil by polymerization under high heat and pressure. Its specific gravity is 1.06 and its Saybolt viscosity is 77 at 212 degrees F. It meets the requirements and limitations of rubber mixing as regards ease of handling and blending with the rubber, freedom from odor, improvement of tackiness after exposure to the air and increase of abrasive wear resistance. This softener gives very satisfactory results in dark stocks compounded for tackiness in processing, high tensile properties and rough service as in tire treads, tire sidewalls, heels, soles, etc. As high as eight per cent on the rubber content can be used in such stocks without detriment to their tensile properties.

### Compounded and Special Softeners

Dispersol is a mixed softening preparation. The combination contains reliable softeners in conjunction with an organic dispersing agent which is peculiarly powerful. No rosin or rosin oil is

<sup>1</sup> Copyright, 1927, by Webster Norris. Continued from INDIA RUBBER WORLD, September 1, 1927, pp. 307-8.

included nor is any oxidizable or deleterious substance present. The material is prepared in two grades, one for light and the other for dark colored stocks and can be employed in a mixing to at least 20 per cent on the rubber present.

Lead oleate results from the reaction of litharge and oleic acid or red oil. It is a waxy material of slightly greasy feel, easily imprinted by the thumbnail, of pale brownish color and heavy gravity. Beside its softening effect as a lubricator in mixing and machine processing, it has specific properties of slightly accelerating the cure, preventing stocks from blooming in the unvulcanized state, and of stabilizing the variability of cure of the lower grades of rubber thus improving their tensile properties. On account of the darkening caused by the presence of lead in curing, lead oleate is used only in stocks of dark color. It is valuable to the extent of 1 to 2 per cent with other softeners and accelerators with which it is compatible in frictions, tire treads, breaker and bead stocks. Also in general mechanical rubber goods, heels and molded articles.

Liquid flux is a tacky softener and free from odor. It contains no flux oil or mineral oil but is composed entirely of vegetable oils and resins with the addition of suitable proportions of stabilizers and age resisters. It is used for its pigment dispersive and wetting effect chiefly in tire frictions, tubed stocks and mechanical rubber goods and in reclaim. It is also suited to hard rubber mixings.

Moldrite is compounded from an asphaltic base with linseed oil, rosin oil, stearic acid and lead oleate. This combination is scientifically selected and blended to give efficiency as a softener and binder with the minimum quantity used. In vulcanization the neutral oil disappears entirely, the other ingredients migrate to the surface of the article and cause easy separation between the rubber and the mold. It is adapted for either solid or pneumatic tire compounding. In tread stocks from 1½ to 2½ per cent is used. The higher the gum content the less softener is required. In stocks for inner tubes, and high grade molded articles such as druggists' sundries, toy balloons, bathing caps, gloves, etc., 1½ per cent is used.

Plastone is chemically the stearate of methylene diphenyldiamine. It functions as a physical softener for the rubber and also as a dispersing agent for carbon black, zinc oxide and other finely divided pigments. The principal field of application for Plastone is in tread compounds and many compounders prefer to use it in treads, rather than any other softener which is available, because it improves the working qualities of the stock without affecting the physical properties of the cured compound. It is also used in tire carcass stocks and mechanical goods compounds wherever it is desired to produce a soft, smooth working compound and where the natural vegetable and mineral oils are objectionable because of their deleterious effect on the tensile strength and modulus of the cured stock. Plastone has a mild accelerating effect, about one tenth that of diphenylguanidine, and this must be taken into account when using it. The amount most commonly used in pneumatic tire tread compounds is 2.0 per cent based on the rubber content. Plastone is seldom used in blooming stocks because it discolors the sulphur bloom. The reason for this is that it dissociates to a certain extent during vulcanization, producing methylene diphenyldiamine, which is responsible for the staining effect.

The properties of plastone may be summed up by saying that it combines the excellent softening effect and mild accelerating power of aniline, and the pigment dispersing properties of stearic acid, but does not have the poisonous characteristics which have led most manufacturers to discard aniline in spite of the fact that it is perhaps the best softener that has ever been found.

Stabilite is a pure organic chemical compound which serves both as a softener and a stabilizer of cure. It softens practically the same as stearic acid but does not prevent adhesion nor bloom out and notably conduces to the flexibility of frictions in tire construction.

### Fatty Acids

Fatty acids, stearic, oleic and palmitic, as rubber softeners are valued especially for their stabilizing effect on the cure of rubbers deficient in natural resins.

Oleic acid, commonly known as red oil, is present in most

natural fats and non-drying oils. It is prepared from the crude acid obtained in the purification of stearic acid forming a secondary product of that operation. It is liquid at ordinary temperatures and solidifies at 39.2 degrees F. It is a true softener wetting both rubber and the compounding materials. Although it functions substantially the same as stearic acid, the latter is preferred because being a solid it is more conveniently handled.

Stearic and other fatty acids in combination with glycerine occurs in animal fats and oils. It is commonly derived from beef fat by saponification or distillation. This process breaks up the fat, liberating both oleic and stearic acids. Following this separation from the fats the material is pressed to remove the liquid oleic acid without the aid of heat. The pressed stock remaining is next hot pressed, once, twice or thrice, to remove more of the low melting point material, leaving behind the purified stearic acid, which is molded into cakes or ground. The single pressed grade is the one commonly used in rubber mixings. It is marketed in block or ground form and has a melting point of 126 degrees F.

Stearic acid has apparently three effects in a rubber compound. These are (1) as a dispersion agent and softener, (2) as a stabilizer of crude rubber to definite curing rate, (3) as an activator of accelerators. Stearic acid serves as a dispersion agent in a compound by reducing surface tension of the ingredients, thus permitting them to be more easily wet by the rubber and absorbed by it. As between rubber and zinc oxide, stearic acid has the effect of wetting both, thus softening by eliminating the stiffening effect of pigment aggregation.

### Oils

All oils have an emollient effect on rubber. Originally, only oils of vegetable origin were considered suitable for inclusion in a rubber mixing and then only where necessary to lubricate the compound and prevent it from generating heat sufficient to cause injury by scorching on the mill, particularly in the case of a stock containing lead compounds. In current practice oils of animal, mineral and vegetable origin are used, according to the special effects that characterize each type.

Degras is the wool grease extracted in scouring the fleece of sheep. Various extraction methods are in use. A favorite one is the Merten's patent naphtha extraction process modified and improved. It yields a product constant in quality, except for slight differences in color due to the class of wool which may be in process. The analytic data of interest in rubber work follows:

#### ANALYSIS OF DEGRAS

	Limits
Melting point .....	95 to 106° E.
Moisture .....	.2 to 3%
Ash .....	.01 to 0.5%
Free fatty acid, figured as oleic.....	Not over 10.5%
Pure wool grease.....	Over 80%
Foreign matter .....	Not over 5%
Saponifiable matter .....	About 60%
Specific gravity at 60 degrees F.....	13.5 to 13.88° B.

Degras has a pale brown color without intensity and can be used in white or any color mixing. It is considered the best softener to use in mixings containing gas black because of the fact that it wets both the rubber and the black and facilitates prompt and easy mixing. Very few softeners possess this double wetting effect and none excel degreas for use with carbon blacks. It is well to use stearic acid with degreas in a rubber mixing to supplement its shortage of free fatty acid.

Woburn oil is obtained from degreasing animal hides. It comes in two grades. The first is a dark colored, semi-opaque oil, somewhat viscous with a fairly strong odor. It contains about 65 per cent saponifiable matter, the balance being mineral hydrocarbons, about 15 per cent free fatty acids, no moisture or other volatile matter. The second is a clear, limpid, reddish oil, free flowing, clean, with slight but not objectionable odor, and of about the same physical constants as the darker grade as regards saponifiable matter, free acid, moisture, volatile, etc. It may be considered as the dark grade highly refined. In rubber mixings, Woburn oil softens without materially increasing tackiness, thus allowing it to be used in large proportions when so desired. By reason of its

saponifiable content, and especially the free fatty acid, Woburn oil works well with organic accelerators.

Cycline oil is a blend of mineral and vegetable oils. Its specific gravity is 0.90. In a rubber mixing it softens and lubricates the stock without inducing tack. It can be used in mixings of all colors and its presence facilitates speed in all machining processes and improves aging.

Pine rosin oil is a distilled product from gum rosin. There are so many different processes used in its manufacture and refining that it cannot be stated that rosin oil in general has any salient characteristics. There are also compounded rosin oils consisting of rosin dissolved in a filtered light gravity mineral lubricating oil. It is marketed in three consistencies, light, medium and heavy, containing the following approximate proportions respectively of oil and rosin.

#### COMMERCIAL ROSIN OIL

Grades	Approximate Percentage Composition	
	Mineral Oil	Rosin
Light	40	60
Medium	30	70
Heavy	20	80

While rosin oil is merely a solution or mechanical mixture the process of blending requires to be conducted skillfully. A certain amount of cooking and agitation is necessary to give the compound the requisite adhesive quality. The practical value of rosin oil as a softener is that it does not come to the surface in an uncured rubber composition, it imparts tack to the stock, both hot and cold, and it is cheap.

Tackol is a blend of resins and oils. Its specific gravity is 0.99. In rubber mixing it is used primarily to keep the uncured stock tacky before vulcanization. It is especially valuable to prevent stocks that are high in reclaim from drying out. Tackol ages exceptionally well and can be used in proportions up to six or seven per cent of the weight of rubber present. From one to five per cent, however, is more generally used for the ordinary practice.

#### ENGLISH AERO TIRE

From the Dunlop Rubber Co., Ltd., comes a challenge of the claim of the Goodrich company to having built the largest aircraft tire, as published in the July issue of INDIA RUBBER WORLD.



Dunlop Tire for Aircraft

The accompanying photograph shows what, in the opinion of the Dunlop company, is the largest tire ever made which was designed and manufactured at the plant at Fort Dunlop, Erdington, Birmingham. The inflated diameter is 88.9 inches with a width of 16.18 inches, and the original date of manufacture was October, 1925.

## Legal Decisions

### Patent Suits

1,090,776, H. H. Boyce, indicating system and apparatus for internal combustion engines, filed June 14, 1927, D. C., N. D. Ill. (E. Div.), Doc. 7196, H. H. Boyce et al. v. Gambill Motor Co. Doc. 7197, H. H. Boyce et al. v. Acorn Tire & Rubber Co. et al.—*Official Gazette*, Volume 362, page 5.

1,238,883, G. O. Burlew, dental tool for cleaning teeth, filed May 12, 1927, D. C., E. D. N. Y., Doc. 3120, G. O. Burlew (J. F. Jelenko) et al. v. Martin Rubber Co., Inc.—*Official Gazette*, Volume 361, page 429.

1,402,067, C. D. Hibbs, fabric-stripping machine, filed June 24, 1927, D. C., N. D. Tex. (Fort Worth), Doc. E 517, Rubber Products Co. et al. v. Pankey Auto Boot Co. et al.—*Official Gazette*, Volume 361, page 430.

### Disclaimers

1,411,231, Morris L. Weiss, Brooklyn, New York, vulcanization accelerator. Patent dated March 28, 1922. Disclaimer filed August 9, 1927, by the assignee, Dovan Chemical Corp., patentee assenting.

Hereby disclaims from the scope of any of the claims of said letters patent all di-substituted guanidines except the one shown in the illustrative formula of said patent, and except di-substituted guanidines wherein one or more of the hydrogen atoms of either or both of the phenyl ( $C_6H_5$ ) groups in said illustrative formula may be substituted by a hydrocarbon radical.—*Official Gazette*, Volume 361, page 894.

### CAUSE OF TREAD THINNESS AT JOINT

A vulcanizer who does an extensive retreading business says that wear is usually more marked where the tread stock is joined than at any other point. This, he claims, is due to thinness, and though quite common in second line tires, it has often been found in the better casings. Variation in the quality of tread stock he dismisses as an unlikely cause; nor does he lay the trouble to the tubing machine, thorough mixing of the compound and uniform thickness being mechanically assured. The cause, he believes, is a certain extra stretch given insensibly by an operator to the strip in finishing his tire building, over-anxious perhaps about making the end of his allotment of tread stock squarely meet its starting point. Even factory inspection may not reveal such minor weakness, for the periphery may be perfect after the tire is taken from the mold, the carcass having accommodated itself to the slight depression during the vulcanizing. The defect is said to be rare or negligible in tires produced on superior tire building machines manned by skillful operatives using first class materials.

### FORD-FIRESTONE JEST A REALITY

Mason Case, vice president of the Los Angeles Realty Board, tells INDIA RUBBER WORLD an odd story about Henry Ford and Harvey S. Firestone. When they visited Los Angeles some time ago to investigate its claims to being an ideal manufacturing and distributing point both were much impressed; but Mr. Ford concluded that in the adjoining city of Long Beach conditions were more favorable for him. "I'll build my motor plant here by the sea," he jestingly remarked to Mr. Firestone, "and, Harvey, suppose you build your rubber plant a little farther away from the salt water." "Why, Henry," Mr. Firestone is quoted as replying, "that will suit me perfectly, for then all I'll have to do is just roll the tires from Los Angeles down Alameda boulevard to your shop, and you can put them on your cars, and roll the cars onto ships and send them to every quarter of the globe." The Ford factory in Long Beach is now half finished and the Firestone factory in Los Angeles, a dozen miles away, is already under construction.

# Degras—Rubber Softener<sup>1</sup>

## *Occurrence of Degras or Wool Grease—Its Extraction—Analysis—Value as a Softener for Rubber Compounds and Reclaims*

THE fleece of sheep is rendered waterproof and its delicate fibers protected from becoming felted and otherwise mechanically injured by an external coating of grease. This is exuded in large quantities by the animal and is known as degreas or wool grease. Unlike other animal fats degreas does not consist of the glycerides of fatty acids, and is with difficulty saponified with caustic alkalies. Its chemical properties resemble those of a wax, as it is composed largely of the higher solid alcohols known as colesterin and isocolesterin both in the free state and as esters with the fatty acids. Though soluble in water and not saponifiable by alkalies, colesterin is easily emulsified, a property on which the usual method of wool scouring is based. Wool grease is easily soluble in naphtha and other solvents.

Credit for the discovery of the usefulness of petroleum distillate for degreasing wool should be given to the late Ellen H. Richards of the Massachusetts Institute of Technology. The engineering work was the work of Emile Mertens.

Fleece from the sheep's back consists of wool, grease, dried perspiration and dirt. The solvent process is based on the properties of two of the raw wool constituents. The grease which naturally protects the wool while on the sheep and which amounts to about 20 per cent of the fleece is readily removed by ordinary high test gasoline. The complete or partial degreasing is readily controllable. The solvent has no effect on wool in contrast to the felting, weakening and harshening of soap and alkali, which may be slight or pronounced, depending on the skill of the scourer. The dried perspiration is a natural soap, which is potash salts of fatty acids. After the solvent process, in which grease only is removed, the wool is treated with warm water only and the naturally occurring soap or dried perspiration is present in the right amounts to remove the dirt, leaving the wool clean, unharmed and ready for manufacture.

### Mertens Wool Degreasing Process

The wool is packed in large steam-jacketed closed steel kiers or tanks, holding about 2,500 pounds each and arranged as indicated in the accompanying diagram. That is to say, the charge of wool rests upon a screen supported somewhat above the bottom of the kier. At the top of the kier a piping connection provides ingress for naphtha. A pipe connection and valve located somewhat above the bottom of the kier serves as egress for the dissolved grease.

After the gasoline has become too greasy to use, it is run into a still. The greasy solvent is heated whereupon the gasoline is driven off to be condensed, emerging perfectly clean and ready for work again. This cycle is continued. The grease which remains in the still is washed with warm water and dried by blowing with warm air. Grease thus obtained by the solvent process contains all the grease which the sheep puts in the wool and only the grease, since it is entirely free from all impurities.

Two other processes are used for removing grease from wool. The principal one, an acid process, is used extensively by European producers of degreas. The material being finally sand filtered. The other method is known as the centrifugal process. This is not greatly favored because of its difficulty and expense.

### Characteristics of Degras

Degras must not be confounded with moellon, which is the grease extracted from the skin of the sheep and not from the wool. Moellon is obtained by pressing the grease out of the skins in the process of making chamois leather.

Following is the proximate analysis of degreas by the Merten solvent process:

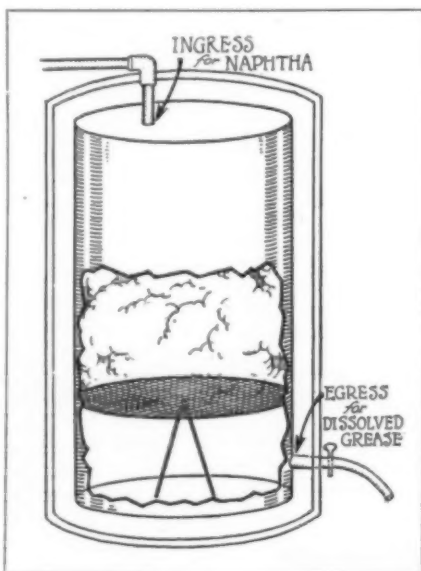
Melting Point	97 to 108° F.
Moisture	.2 to 2.5 per cent
Ash	.01 to 0.5 per cent
Free Fatty Acid (as oleic acid)	.7 to 8 per cent
Pure Wool Grease	Over 80 per cent
Foreign Matter	Not over 5 per cent
Saponifiable Matter	About 60 per cent
Specific Gravity at 60 Degrees F.	13.15 to 13.88 Bé.
Saponification Number	113 to 123
Acid Value	Not over 20.9 per cent
Viscosity at 210 degrees F. (Tagliabue)	284 to 292
Flash Point	382 to 390° F.
Fire Test	527 to 536° F.
Cold Test	94° F.

### Degras in Rubber and Reclaims

Degras as a rubber softener was used for many years in a small way, particularly in compounding stocks for mechanical goods. The development of tire tread stocks with improved tensile properties and great resistance against abrasive wear resulted in rapidly increasing the volume proportions of reinforcing pigments needed, particularly the so-called hard carbon blacks, clays, etc. The diminutive particle size of these pigments, especially carbon black, makes difficult

their dispersion because their large surface tension induces aggregation instead of dispersion of the material in the rubber mixing. In this connection the aid of a softener is required to relieve this surface tension and allow wetting the particles by the rubber.

Research by leading American rubber chemists has revealed the fact, that of the long list of commonly used softeners, degreas excels in the readiness with which it wets carbon black which is notoriously resistant and prone to aggregation and stiffening of rubber mixings when the most efficient softeners are not employed. The excellence of degreas in this respect applies to its use as an aid to the dispersion of any dry powder or reclaim comprised in a rubber mixing. In addition to this outstanding merit degreas acts as a good emollient for reducing the power used in milling and other machine processings and speeding up production. Degreas is entirely compatible with any of the long list of rubber softeners, accelerators and compounding ingredients in common use. It is handled conveniently as a grease that melts almost at the heat of the hand. Its flash point, 382 to 390 degrees F., is far above the temperature of vulcanization and insures its stability. In the manufacture of reclaimed rubber degreas functions to considerable advantage as a softener and aid in pigmentation, where the latter is resorted to in making reclaims to specifications of cost.



Kier for Solvent Extraction of Degras from Wool

<sup>1</sup> Data supplied by W. L. Montgomery & Co., Boston, Massachusetts.

# Seven Years' Experience with a Mill Room Testing Laboratory<sup>1</sup>

*A brief account of how many factory problems were solved by subjecting each milled batch to a few simple tests*

R. M. WARNER

The Miller Rubber Co., Akron, Ohio

IN a rubber factory where the line of manufacture is limited to a few articles, and the required compounds are few in number, the compounding chemist can keep closely enough in touch with his stocks to avoid a great deal of factory trouble. Adequate laboratory supervision is very difficult in a plant where the number of articles manufactured is numerous, and the necessary compounds are correspondingly multiplied. This is especially true where the products of manufacture are so widely different as to require rubber compounds of almost every conceivable kind. The lack of adequate laboratory supervision leads to many factory troubles which interfere materially with production, and frequently affect the quality of the finished goods.

Prior to the installation of a mill room testing laboratory, a considerable part of the compounder's time was spent in dealing with troubles due to stock variation. Stocks undercured or overcured, scorched on the calender or stuck to the liners, varied in color and presented the many other undesirable characteristics with which every compounder is familiar. Occasionally it was necessary to suspend production on some article until all of the uncured stock on hand could be scrapped and a fresh mixing put through. Several experiences of this kind, at times when production was badly needed, gave rise to a thorough investigation of compounding, mixing and calendering conditions. A part of this study consisted in saving a sample of each batch mixed for one day. A thorough examination of these samples revealed the alarming result that about 9 per cent of the batches were defective. While the major part of these would have passed through the factory without notice, at least 1½ per cent would have resulted in some sort of factory trouble. Further investigation showed that defective stock was due largely to the following causes: (1) Improper weighing, omission and substitution of compounding ingredients; (2) insufficient mixing; (3) high mill temperatures; (4) variation in plasticity due to lack of uniformity in milling methods; (5) stock mix-ups.

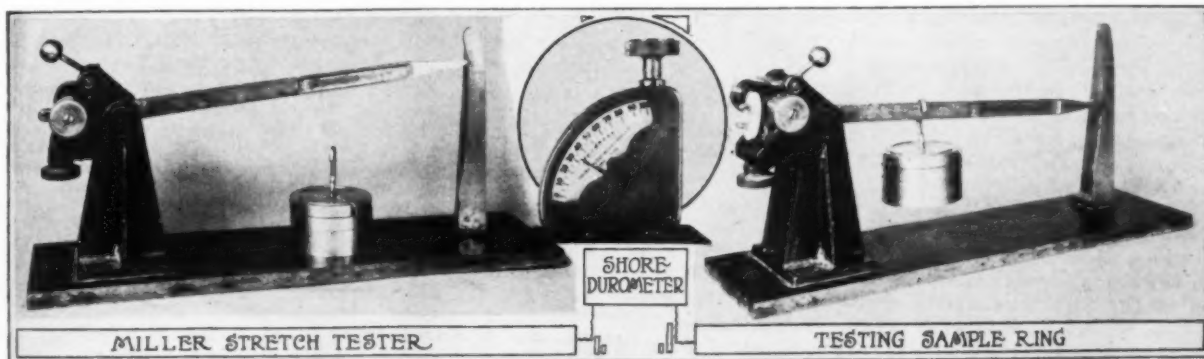
At the completion of a thorough study, it was concluded that the majority of factory troubles have their origin in the com-

pound and mill rooms, and that some adequate means of sorting out the defective batches would go a long way toward eliminating these troubles.

Obviously the first step in a program of this kind was to reduce the number of defective batches to a minimum. To accomplish this end, several improvements were instituted in compound and mill room practice. Among these were the fixing of definite mixing specifications for each batch of stock, the installation of a refrigeration plant for cooling mill water and a more thorough inspection over mill room and compound room operations. These improvements were beneficial but still left much to be desired. It was found that no matter how thoroughly raw materials were tested and no matter how carefully compounding and mixing operations were controlled, there was a constant occurrence of errors resulting in stock which was entirely unfit for the purpose intended. This led finally to the institution of a mill room laboratory where each batch of stock could be tested and the defective batches discarded. Such a laboratory has now been in operation for a little over seven years with very satisfactory results.

The tests used in a laboratory of this kind must be simple enough to be carried out quickly in order to avoid holding up large quantities of milled stock. It is desirable, also, to discover any compounding errors as soon as possible after a mixing is started, so the error can be corrected in the unmixed batches. To meet these requirements tests of six properties are made in this laboratory, namely, cure, hardness, stretch, specific gravity, color, and plasticity. Some stocks are subjected to all of these tests and others to a part of them. The tendency, however, is toward more testing rather than to find any one of the tests unnecessary and therefore to discontinue it. A sample is obtained from each batch as soon as it has been taken from the mixing mill. The laboratory is required to test the samples and to furnish a report at the end of the half hour which is allowed for cooling the stocks. The tests are carried out in the following order:

CURE. Each sample is cured in the form of a small ring, ½ inch inside diameter, 1½ inch outside diameter, and ¼ inch thick. The cures are made in ordinary hydraulic presses in multiple cavity molds which accommodate 24 samples at one time. Each



<sup>1</sup> Read at the meeting of the Rubber Division A.C.S. held April 11-16, 1927, at Richmond, Virginia.

stock is cured as nearly as possible to its correct factory cure. The stocks are classified according to cure into eight groups, the shortest of which is  $1\frac{1}{2}$  inches at 60 pounds, and the longest, 15 feet at 90 pounds steam. After cure, the samples are cooled in water.

**HARDNESS.** Each sample is then tested for hardness with a Shore durometer. A record is kept of these readings and experience has established limits within which satisfactory stock must fall. Batches testing outside of these limits are rejected. To make this test of value the durometers must be checked frequently as they get out of adjustment rather easily.

**STRETCH.** It has been found that the measurement of the stretch of a sample of rubber of standard dimensions under a given load is a very sensitive and accurate measurement of the state of cure. This test is about five times as sensitive as the hardness test. The test is carried out with a machine which was designed and built by the Miller Rubber Co. It consists of a scale beam which is free to move on a knife-edge. The short end of the beam is made semi-circular in cross section and this, together with a stationary peg of the same shape, forms a round plug equal in diameter to the inside diameter of the test ring. The short arm of the beam is counter weighted to balance the long arm, which is about five times as long. This arm is notched at four places, making divisions equal in length to the short arm and carries a movable 5-pound weight, which can be placed at any one of the four positions, depending upon the stiffness of the stock to be tested. The end of the long beam is pointed and moves over a perpendicular scale  $4\frac{1}{2}$  inches in length and graduated to 10ths of an inch. Thus the test is simply the measurement in inches of the stretch of a ring of rubber of standard dimensions when subjected to a pull of 5, 10, 15, or 20 pounds.

To test a sample, the ring of rubber is placed over the beam and peg and the beam is then released. The weight is moved to the one of the four positions which will cause the pointer to move to the central part of the scale. The measure of the stretch is recorded by noting the position of the weight as 1, 2, 3, or 4, and after this the reading on the scale. Here again definite limits have been established and stock which does not test within these limits is discarded. This test is a good check on proper mixing, as a poorly mixed batch will vary in cure in different portions of it. Consequently, any batch which does not fall within the limits of this test is resampled, taking one sample from each of three different slabs of stock. If these samples test consistently defective, the batch is rejected. Frequently there is variation enough in the three samples to indicate insufficient mixing, and a remilling of the batch and retest bring the stock up to specifications.

**SPECIFIC GRAVITY.** The specific gravity of all stocks heavier than 1.10 is determined. This is done very quickly by the use of standard aqueous solutions of zinc chloride. The solutions are standardized at the beginning of each shift with a Westphal balance. Batches which fall outside of the limits set for gravity are resampled also, and in case of variation are remilled and retested.

**COLOR.** All bright colored batches, such as those used in making bottles, bathing caps and toys, are examined for color. Cold vulcanization stocks are examined without curing and vulcanizing stocks after cure, by comparison with standard samples which are kept on file. Wherever possible, off-color batches are corrected by the addition of the proper pigments.

**PLASTICITY.** The foregoing tests are used primarily to determine the suitability of the stocks for the final cured product. The calendaring and tubing properties of stocks are checked with William's plastometers. Batches which have been found by experience to be too stiff are remilled. Batches which are below the limits of plasticity are kept separate and are blended with the satisfactory stock. This almost entirely eliminates scorching of stock on the calendars and tube machines, bloomed stock and stock which is too tacky to be removed from the liners.

This laboratory has practically eliminated the common factory troubles which are ordinarily accredited to the compounders. All stocks which leave the mill room are thoroughly mixed, correctly compounded and of the proper consistency to calender and tube

well. Although the number of batches rejected is small, past experience has shown that most factory trouble is traceable to this small percentage of defective stock. During the years in which records have been kept, the amount of stock which is rejected has varied from .625 to 2 per cent. In addition to this, approximately 3 per cent defective stock is corrected and passed through. That is, from 4 to 5 per cent would pass through into the finished goods departments if no means of detecting it were used. The saving in time and in the reduction of scrap more than pays for the relatively small expense involved in the maintenance and operation of this laboratory.

The laboratory and test routine described are the results of the work of the whole laboratory personnel of the Miller Rubber Co. The author wishes to acknowledge his indebtedness to these colleagues for help in preparing this paper.

### NEOZONE—NEW ANTI-OXIDANT

Neozone, a new anti-oxidant for all types of rubber products, is a non-toxic solid material in the form of thin gray flakes that look and feel much like soap chips. Exceedingly small percentages effect remarkable improvement in the aging properties of rubber compounds. The melting point is sufficiently high so that no running together in the can or barrel occurs and the stock may be handled and weighed as any dry filler. On the other hand, it will not dust as most dry compounding ingredients do. On the mill it melts, dispersing very readily in the rubber, and its excellent anti-oxidant properties are attributed in part to this thoroughness of dispersion.

While classed as an anti-oxidant, Neozone is equally effective in improving the resistance of rubber compounds to high temperatures regardless of whether oxygen is present. This property is especially important in bus and truck tubes which are simultaneously exposed to high temperatures and to air.

Neozone neither accelerates nor retards vulcanization but does increase the tensile strength of compounds accelerated with Thionex. It also generally causes a slight increase in the modulus and that, with the increase in the tensile strength, results in a decided improvement in resilient energy of the stock. It is well known that the resilient energy of a tread compound is a valuable index of its abrasion resistance. Therefore the addition of a small percentage of Neozone has a favorable influence on tread compounds in that particular.

Protection against oxidation is even more essential in cheap compounds containing little or no crude rubber than in high grade pneumatic tire stocks and Neozone is favored for use in low grade compounds because as little as 0.25 per cent of it materially enhances the resistance to aging in compounds containing large percentages of reclaimed rubber. Hence the material qualifies on the score of cheapness.

### TO EXPEDITE FOREIGN SERVICE

The Department of Commerce requests that manufacturers, wishing to use its foreign offices to secure foreign representation, enclose sufficient copies of catalogs and price lists so that several prospects may be approached simultaneously. Part of a letter on this subject from Trade Commissioner James F. Burke, at Barcelona, is quoted as follow:

It has been noted that many American manufacturers in requesting this office to aid them in finding representatives and agents in this district are only enclosing one set of catalogs and price lists with their letters. It is obviously very difficult to render service of this kind when various firms have to be approached and each of them requires copies of such catalogs and price lists in order that they may study the matter properly. Whenever possible, pertinent information regarding prices and terms of sale is stated in a letter which is left with the local firm upon a call, but it is frequently quite impossible to give all the necessary information.

"RUBBER COMPOUNDING PRACTICE," NOW RUNNING SERIALLY IN INDIA RUBBER WORLD, is read with great interest by all practical rubber men.



Fig. 1.—Presses that Form the Ball Halves

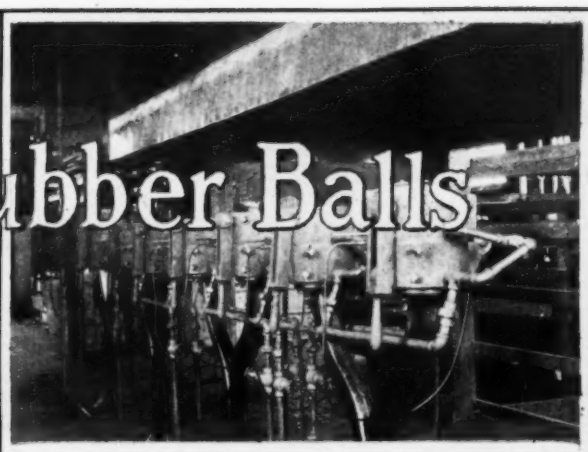


Fig. 2.—Single Cavity Vulcanizing Molds

*Play balls are being manufactured in ever increasing quantities and their popularity has created a demand which has exceeded the supply for several seasons past*

IT is not the intention of this article to cover the entire range of processes and methods employed in play ball manufacturing but rather to describe one very unique process that has been developed and patented by Joseph W. Weaver and used in his factory at Lebanon, Pennsylvania. This is interesting for the reason that prior to entry into ball manufacturing the inventor was without rubber experience, yet he has not only conceived and developed the processes but, being a machinist by training, he has designed and built the principal units of manufacturing equipment in daily use in his factory.

This establishment manufactures the so-called Weaver health ball in two types only, one being plain black and the other of a mottled red, green, blue, white and black coloring, reminding one very much of the old fashioned "crazy quilts" which our grandmothers made. No attempt is made to produce imitations of footballs, baseballs or other novelties, and neither does this concern make the smaller sizes of play balls, the manufacturing being confined to four sizes—5½ inches, 7 inches, 10 inches and 12½ inches diameter, all with smooth surface.

The factory is a three-story building, consisting of a semi-basement and two upper floors. The compound room, with space for crude rubber and other ingredients, is located in one end of the first floor, or semi-basement, the balance of the space being taken up with mixing mills, hydraulic and other generating apparatus. On the second floor, at one end is located a machine shop for repairs to mechanical equipment and where Mr. Weaver has built the specially designed apparatus above referred to. The finished goods storage, shipping and receiving departments and offices are also located on this floor. The entire third floor is used for manufacturing the product.

The base stock is black and is prepared by mixing pale crepe or smoked sheet, gas black, reclaim, fillers and an accelerator, and

sheeting this batch on the mills, no calender being used. These sheets of dense black stock are taken off in varying thicknesses, depending on the size of the balls to be made, that for a 7-inch ball being approximately one-half inch thick. Following a suitable cooling interval, this sheet stock is cut into squares, the size again being determined by the size of the ball. For a 7-inch ball, two blocks, approximately three inches square are necessary. Such of these blocks as are to be made into the mottled balls are now taken to the decorating department, separate containers being used for each of the four sizes of blocks.

The decorating material is sheet rubber stock calendered to about .010-inch and rolled in a manner similar to tube repair material. The four decorating colors are red, green, blue and white, the base stock of black contributing the fifth color to the combination. The decorating is performed by women, each of whom has before her sheets of the several colors of rubber sheet from which small pieces, of an inch or less square, are cut. These are laid alternately along the edges of the

block. Additional pieces are laid on one side of the block, overlapping one another, no attempt being made to form a regular design but rather to cover the black surface with the colored stock at random. No cement is used in this operation, the natural tack of the stocks being sufficient to hold them together until vulcanized. Next, the blocks for the decorated, as well as those for the plain black balls, are paired and weighed and any deficiency in weight is made up by sticking a sufficient quantity of black stock to the back or undecorated side of the block.

These blocks are now ready for the first molding operation, that of pressing or forming each block into a hemisphere or half ball. This as well as the molding of the complete ball is done in single cavity presses. While the two smaller sizes could be made in multiple cavity molds, the 10-inch and larger balls require single

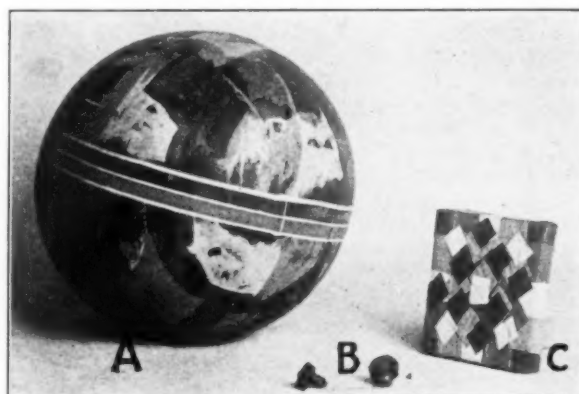


Fig. 3.—(A) Finished Ball. (B) Inflation Plugs. (C) Decorated Rubber Blocks

cavity forming and for the sake of uniform operation all four sizes are made in this way.

The machines on which the forming of the half ball is done were specially designed for the purpose and merit a word of description. Two single cavity female, steam jacketed molds are mounted on a cast iron Y base, the opening about 36 inches above the floor. Into cast bosses on the sides of each mold are threaded two tie rods which attach to a cast iron cross member above and support an air or hydraulic cylinder, the piston rod of which is carried down through a bearing in a toggled cross member and bolted to a cast iron yoke. On each end of this yoke is attached the upper or male part of the mold, also steam jacketed. Three of these machines are shown in Figure 1.

The idea in yoking two of the forming molds to one actuating cylinder is not primarily to save on the first cost of the machine or its operation, but to insure uniformity in the two half balls as when formed separately there was likely to be some difference in the gage of the wall due to varying pressure in the cylinders.

A block of stock is placed in each cavity with the decorated side downward, care being taken to center it in the mold. The air or hydraulic pressure is admitted to the cylinder above, which causes the piston or plunger to move downward into the mold forming the block into a half ball, the several colors of rubber smearing or running under the influence of heat and pressure and giving to the surface of the ball the desired mottling effect. Illustration C in Figure 3 shows the block of rubber decorated and ready for forming, two such blocks being required for the ball shown at A.

A seven-minute semi-cure is given in the forming press, following which the half balls are removed and placed in portable racks, due care being taken to keep the halves formed in the same press in pairs so that there will be no difficulty in fitting them together. The half balls next go to the operators who trim off the overflow and cement the edges. Following a suitable interval to allow the cement to dry sufficiently, they are fitted together and the seam run through a machine known as a knitter or stitcher.

This machine consists of a pair of solid cast steel wheels, about two inches in diameter, motor driven, one having a concave edge and the other a convex edge and so set that ample stitching pressure is exerted on the seam or splice as the ball is passed through. Next a one-inch wide ribbon of rubber sheet of two colors and of the same gage as the decorating material is laid over the splice and stitched, this serving the double purpose of covering the seam and further decorating the ball, which is now ready for the final vulcanizing.

The vulcanizers are single cavity, steam-jacketed molds, split horizontally in the center. The lower half is attached to a floor stand, the upper and lower halves of the mold being held together by a back hinge. The locking device is a handle hinged to the upper part of the mold and wedge locking over a boss cast on the lower half. Figure 2 shows one battery of these curing molds.

The ball is placed in the mold so that the splice or seam is in a vertical position and at right angles to the split in the mold, which is then locked, the ball being formed to the mold shape by constant air pressure admitted to the inside of the ball. The final cure is for ten minutes at approximately 300 degrees of heat.

Following the final curing the balls are placed in portable bins and delivered to a department, where they are closely inspected for possible defects, the overflow and any rough spots buffed off and the balls placed in racks for inflation. First, a flanged rubber plug, two of which may be seen at B in Figure 3, is coated with cement and forced into a hole in the ball made for the purpose, with the flange inside the ball. A small brass tube, connected to a compressed air line, is inserted beside the plug and the ball inflated to a gage indicating the desired diameter of the finished ball. No attention is given to the pressure necessary, the object being to inflate the balls to a uniform size. When the inflating tool is withdrawn the plug automatically seals the hole. After a suitable interval the balls are again inspected and gaged to determine whether any leaks have developed, and if not, the excess rubber is trimmed from the plug and the ball is complete.

## Cost of a Weak Policy

Eager to be famed for not exploiting dependencies, Americans are likely to swing to the other extreme which not only puts them at a disadvantage but also their dependents, as in failing to help the latter to help themselves. The Philippines afford a case in point. Since the islands were ceded to the United States in 1898 they have prospered immeasurably, but the substantial benefits derived by this country have been so inconsiderable that the \$20,000,000 gratuity to Spain and the expenditure of \$200,000,000 since for administration have been regarded by many as waste and the retention of the possession as of doubtful expediency. However, it is quite probable that were the islands dominated by any other great power the tail would never have wagged the dog as shown in the insular attitude of continually opposing American enterprise that could not but redound largely to the benefit of the islanders.

As long ago as 1874 an able Spanish commissioner, Don Sebastian Vidal y Soler, sent to investigate forestry and allied conditions, submitted to his government a remarkably comprehensive plan for the welfare of the islands. Remarking that there were vast areas which could never be adequately developed through individual initiative, he recommended that such lands be delimited and prospectuses be published in Europe and America to attract concessionaries for their development. Revenue from such sales would go to help Filipinos improve intensively the remaining lands. He prophesied close commercial interdependence between the Philippines and the United States, and insisted that two things were imperative for the islands if they were ever to flourish, namely, labor and capital, for which he urged hearty welcome and unfailing security.

Such discerning judgment was not appreciated by the Spanish bureaucrats. Foreign influence was feared; and the same bogey has long troubled the Little Philippines party which controls the insular legislature. At least that is the excuse given for the latter maintaining a dog-in-the-manger attitude through illiberal land and labor limitations. Meanwhile the nation that owns the islands, and which would not submit to such disdain on the part of any of its states and territories, must stand idly by and witness other nations with strong colonial policies so develop the resources of their distant dependencies as to even heavily penalize if not actually menace American industry.

Of the 4,500,000 acres of far eastern rubber plantations, largely planted since the Spanish-American war, the Philippines boast of but 2,890 acres, of which scarcely more than 600 are said to have tappable trees. Yet our government investigators have found 1,500,000 acres in the islands ideally suited for rubber cultivation. Americans can hardly be proud of such a showing after nearly three decades of ownership; and, finding that they are put at a serious disadvantage regarding an essential raw material, they may put the blame not only on the Little Philippines party but also on the Little Americans through whose complacency we have suffered much loss in wealth and prestige.

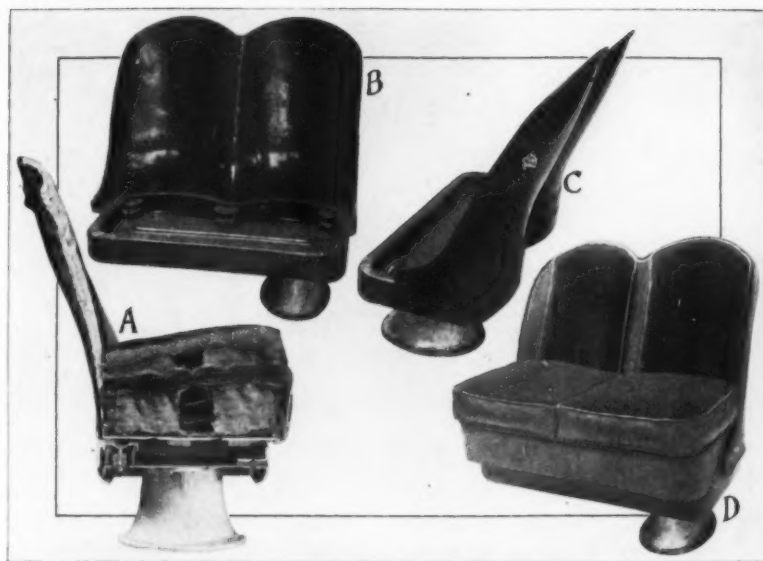
## STABILITE

Stabilite is the trade designation of a pure organic chemical compound. It serves as an excellent softener practically the same as stearic acid except that it does not bloom out. As an age resister in inner tubes it protects the rubber from breaking down under the high heat developed in tire service, particularly in the case of bus tires where the rubber is apt to deteriorate and become soft and flabby by heat.

Stabilite is particularly valuable in tread stocks, particularly where liable to overcure, because it confers practically the same aging protection alike to correctly cured and overcured stock. In actual practice the better aging properties of stabilite cause a great increase in the wearing properties of the tread after the tire is a year old. In the case of new tires it decreases the amount of splitting, chipping, etc., and gives slightly better wear than in stocks containing no stabilite.

# Shock Insulated Bus Seat<sup>1</sup>

*Rubber Suspension of Bus  
Chair Seats Supplies  
Smooth Riding Feature  
Essential to Comfort in  
Long Distance Travel  
in Bus or Rail-  
way Car*



**Rubber Shock Insulated Chair**

A—VERTICAL SECTION. B—THREE RUBBER SPRINGS SUPPORT BACK. C—TWO RUBBER HINGES SUPPORT FRONT. D—FINISHED UPHOLSTERED CHAIR.

IT is several years since the original introduction of rubber in the spring shackles of motor trucks. Their adoption proved so effective in extending the life of motor vehicles and their ease of riding that rubber suspension has been developed and applied at all points in bus construction where road shocks and vibrations can be intercepted. The rapid increase in the number of buses engaged in inter-urban and long distance transportation emphasized the need of applying rubber shock insulation to passenger seats. Thus making long distance riding more attractive by being made more comfortable.

Of necessity, bus chairs are securely attached to the floor of the car and consequently transmit to the rider all residual road shocks not intercepted by the springs and various points of rubber insulation on the chassis. Such shocks have a disagreeable cumulative effect which is more or less fatiguing to the rider. However, these have been virtually eliminated completely by the engineering study of chair design and construction resulting in the chair now adopted for de luxe and long distance bus travel.

The construction of this seat and the method of suspending it on rubber under compression is pictured in the group illustration. A shows in vertical section the construction of a bus chair mounted upon a floor pedestal. The chair has a form-fitting back made of sheet aluminum united to the seat or cushion support. The chair frame is connected to the under support by rubber hinges upon which the chair floats. Thus, front and back there is no metal contact between the chair proper and its base. The sectional view shows also the design and location of the rubber parts. Each of the back rubber supports comprises an outer hollow cylinder and a shorter inner one located in a metal housing within the hollow cylinder. Both are held together under compression by a through bolt which compresses the springs in their housings. The outer rubber compresses under the weight of the person in the chair while the inner rubber acts as a snubber and receives the rebound caused by road shocks.

Under the front edge of the seat a flat molded plate of rubber serves as an elastic hinge or support connecting the frame of the chair to the base. The back rubber springs, three in number for a double chair, are shown in B. The front rubber hinges, two in number, are shown in C. This arrangement of rubber spring in-

sulation absorbs all small shocks and vibrations and also gives the seat a certain amount of flexibility. It also permits the back of the chair to incline backward and slightly under pressure and by thus taking out the rigidity, adding in no small degree to the comfort of the passenger. The form-fitting curves of the chair back also contribute most restful support to the body and assure the least amount of fatigue in long journeys.

The lower upholstered cushion has the usual spiral springs while above this is a second cushion containing lighter spirals, the finished upholstered seat presenting the appearance shown in D.

This chair construction embodying suspension of the chair on rubber under compression was evolved after much study and experimentation. It apparently has solved the problem of affording ease and comfort to bus passengers by eliminating whatever small vibrations would otherwise reach the rider through the bus floor in spite of steel springs and shock insulators interposed at numerous points on the chassis.

Chairs of the construction described are also being installed in railway cars especially in those operated by International motors where economy of space as well as comfort of passengers is an item of much importance.

## **RUBBER HORSESHOES MUCH USED**

Despite all its merits, the automobile is not likely to wholly replace the horse for a long time. For some work Old Dobbin is still considered indispensable. One large creamery in a western city alone has 600 horses and intends to get more. Of these 200 are rubber shod. That is, to their hoofs are attached special pads of tread stock rubber having a heel or raised oblong bar across the rear end, tarred oakum being used as a cementing cushion. Over this is nailed a plain wrought iron shoe with a toe clip, and the ends of which are shortened to abut the raised rubber part.

Nervous sleepers in residence sections appreciate the use of the rubberized shoes in almost eliminating the clattering of hoofs of the milk wagon horses in the early morning; but the chief reason why such shock absorbers are used is to prevent the horses getting muscle soreness in pounding on hard pavements, as well as to prevent slipping in wet weather. The reason given for preferring horses to motor cars is that the horses have proved more economical. In making house-to-house stops with cars it has been found that each start not only taxes batteries severely, but also causes excessive tire tread wear.

<sup>1</sup> Data and illustrations contributed by the International Motor Co., New York, N. Y.



R. G. Bulletin

Young and Mature Rubber Trees—A Diorama at the Imperial Institute, London

# How to Grow Rubber

*Successful and Practical Methods*  
Plantations, Inc.,

THE power of an idea for good or bad finds an excellent illustration in the short history of plantation rubber. When rubber estates were first projected in the Orient it was assumed they should be treated as forests. It occurred to none to consider them as orchards. Yet subsequent developments have shown conclusively that the problems of rubber planting are those peculiar to the orchardist and not to the forester. From the emphasis of regarding a rubber estate as a forest can be traced the early practices pursued on all rubber estates prior to 1918. This date really marks the turning point. The emphasis changes, scientific research points the way to new practices, and the modern era of rubber orchards is ushered in.

How this new era was brought about is an interesting record of achievement. That an American company should have been the most influential factor in bringing about this change in estate practice makes the story all the more interesting to American readers.

A rubber plantation represents an intensive culture where every tree has an economic value. Each tree's characteristics as to rubber yields must be known, much as the records kept by a dairyman of the yields of his herd. Each tree must be taken care of individually if attacked by disease. Its possibilities as a source of buds or seeds for the artificial propagation of its kind must be known. In short, the estate can no longer be regarded as a collective unit of so many trees giving a total yield of so many pounds of rubber a year; it is an orchard of individual trees where every thing which science has discovered must be taken advantage of to improve the breed, the yield and the quality of rubber.

## Van Helten Publishes His Research

In any large industry progress results from the thoughts and cumulative experience of all. Some one person may appear who is able to draw together these loose thoughts and present them in an acceptable form. This is strikingly seen in the publication by Mr. Van Helten, scientist at the famous botanical station at Buitenzorg, Java, in 1918, on bud grafting methods as applied to the Hevea tree. This was the first published record of practical success in vegetative propagation by budding. A practical planter, Mr. Bodde, of Pasir Waringin Estate, Java, had been working on this method for several years previously. Many others from 1910 on had attempted it and had discussed it. The idea of getting better rubber trees by selection and breeding engaged the attention of many of the leaders who had noticed the wide variation in the yield of individual trees. Van Helten's publication stimulated interest. Practical research on a large scale soon followed, especially in Sumatra. The United States Rubber Plantation, Inc., known in Sumatra by the symbol HAPM (Holland-American Plantation Maatschappij) had begun a research program as early as 1915, but it was 1917 before systematic selection work was started.

How did this organization go about its selection work and what justification was there for its program? The guiding principles governing the selection of stock have to do with rubber yield, disease resistance and quality of rubber. The reason for this is apparent. Yield of rubber is something which depends directly upon some inherent property of the tree itself. It may be influenced by soil conditions, climate and other factors in the environment, but nothing can be done to raise the yield beyond a maximum that is specific to that tree. Hence, to increase the yield it is necessary to select and breed trees which will have a higher maximum capacity as an inherent characteristic. What follows is essentially the story of how this breeding was performed.

## Principles Utilized in Stock Selection

Disease resistance is a factor that is also an inherent property of each tree. This is true of all living things. We all know how individuals in the same family display disease resistance differently. Holstein cows we know are less susceptible to tuberculosis than Jerseys. In the fruit world, some varieties of a species are immune to some disease, while others are easy victims. Because this immunity to disease is inherent, breeders can and do select those strains which show a higher resistance and breed them. In the work of selecting better rubber trees this factor has been kept in mind, but perhaps not as strongly as the factor of higher yields. Reports from Sumatra already indicate that buddings from different mother trees show variable disease resistance.

The question of quality of the rubber has, so far as is known, not been studied in relation to artificial reproduction. Yet it is well known that the latex of some trees on the same plantation differs in color, rubber content and other properties. Owing to its being of minor importance, since the differences are reduced by the practice of bulking all latex, the question of quality will have to wait future research.

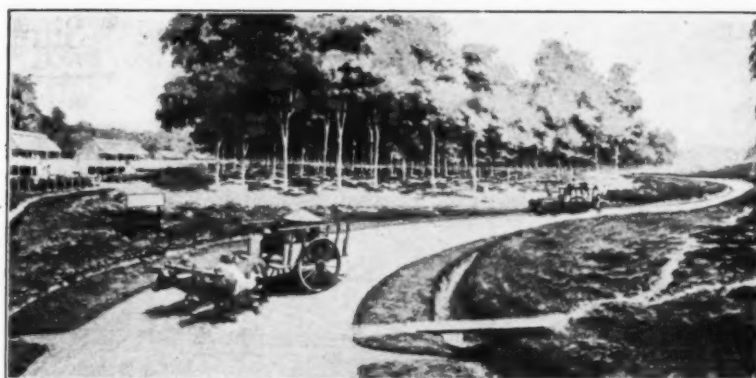
There are several methods by which to improve the stock of plantation rubber trees on the basis of the principles just referred to. Seed selection, seedling selection, vegetative reproduction by bud grafts, artificial pollination and, lastly, the empirical method of planting a large number of trees and selecting on test results. All these methods have been used with varying success. We are interested now primarily in the method pursued by the United States Rubber Plantations, which is that of bud grafts.

## The Story of Budding

The superiority of the stock that was to be selected and multiplied had to be established. This part of the program was very important. It was attacked in two ways. First, they had to determine beyond doubt that a tree which was yielding more than its neighbors, did this year after year because of its inherent nature. If it did, then that property could be expected to be reproduced in its offspring. Also, they had to establish, the converse,

# High Yielding Trees

Employed by United States Rubber in Sumatra, N. E. I.



R. G. Bulletin  
Typical Malayan Plantation—A Diorama at the Imperial Institute, London

that a poor yielder always remained as such. To make this determination the yield of every tree on a uniform area of 12½ acres was collected every day, and records of the dry rubber from each tree were made twice a month. These records, begun in March, 1917, have been continued to the present time. The results of nine years' records are grouped in Table I.

TABLE I

Class	No. of Trees	Average Actual Yield Per Tree in Lbs. Per Year
1	1	21.7
1	3	18.0
1	7	15.8
2	22	13.1
2	52	10.8
3	127	8.6
3	313	6.1
4	351	3.7
4	42	2.1

Total trees, 918. Average yield of all trees, 5.9 lbs. annually.

From this table we note that the yield of the best class is over three times the average yield. The distribution of the different classes is significant. On this particular area, about 90 per cent of the trees gave a yield of about 5 pounds per year, as against the 10 per cent giving an average yield of about 16 pounds.

This experiment formed the ground work of subsequent research. The next step was to survey the whole plantation for the purpose of confirming these preliminary results and then for the selection of the superior trees. To facilitate the work it was decided to measure the yield once a month for each tree. Certain symbols were devised to correspond with various amounts. For example, one dot would mean 5 cubic inches of latex; two dots, 10 cubic inches, and so on. The tapper on the first of each month would pour the latex from the cup into a glass graduate marked with the symbols, and record on the tree above the tapping surface the appropriate symbol. This method was first proved accurate enough by statistical calculation. In this fashion about 4,500,000 trees on 37,000 acres were tested, marked and classified for four consecutive years.

After the first year's marking, they selected the highest yielders and indicated them by a special symbol. To make a refinement on the method, all the high yielders were subsequently measured with a special, large-sized glass graduate and the yield recorded. The results of this survey over 37,000 acres, after four years' recording, are grouped in Table II.

TABLE II

Class	No. of Trees	Per Cent of Total Number of Trees	Average Yield in Pounds Dry Rubber for 1921
1	1,292	0.03	14
2	31,487	0.70	10
3	198,411	4.50	7

The average yield for 1921 for all trees was  $\pm 3$  pounds per year.

From these superior classes they next chose 250 of the very best for permanent record. These trees were tapped daily, the dry

rubber was weighed and recorded separately. It was found that the premier tree gave, during 1924, a yield of 55 pounds, and 52 pounds the next year. Seventeen of these trees in 1924 and 21 in 1925 gave a yield in excess of 30 pounds. Since all these trees were scattered in the ordinary plantations and were not favored by isolation to make their maximum development, the extraordinary yields of 30 to 54 pounds are the more remarkable. Perhaps it would be expecting too much to be able to reproduce an extensive area of such extraordinarily high yielders. And yet, why not?

## The Bud Grafts

The basic selection having been performed, the very best trees having been singled out, the next thing to do was to bud graft by using buds from these superior trees. The first buddings on HAPM were made in August, 1918. Buds obtained from mother trees were grafted on to seedlings in nursery beds. In November, 1918, ten acres were planted up with these buddings. These same buddings were the first to be brought into tapping. Sixty of the best developed were tapped on May 2, 1922. A few days later tapping operations were also commenced on buddings at Pasir Waringin Estate in Java. Following the success of these first buddings, larger scale plantings exclusively with buddings were made in 1920 and 1921. Buddings alternated with selected seed were extensively planted in 1921 and 1922. In these buddings, only material from Class I mother trees, recorded on the basic selection program of 1918, were used.

Considering the uncertainties of the yielding power of buddings, and the influence which the root system of the stocks might exercise on the physiology of the budding, it took courage and faith to plant extensively with buddings. The alternate budding and selected seed plantings are a reminder of the existing doubt. If the buddings failed, the selected seed could be relied upon to yield as good a return as by the old method.

## Buddings Are Tapped

In speaking of buddings, we will have to use the word clone. A clone means the offspring of a single mother tree by vegetative reproduction as opposed to seeds which are by sexual reproduction. It was expected that the inherent characteristics of the mother tree would be reproduced in its offspring by the budding operation. A clone shows the family trait. The yield trait of the clone seems to be constant, as will be noted in Table III.

TABLE III

		Average Yield in Pounds per Tree per Year			
		4th-5th Yr.	5th-6th Yr.	6th-7th Yr.	7th-8th Yr.
Clone					
A	Good	5.7	7.4	9.6	8.6
B	Good	4.7	8.5	11.0	11.4
C	Good	3.9	6.7	11.2	10.6
D	Fair	2.2	3.8	6.5	7.8
E	Fair	3.2	5.7	7.6	7.4
F	Poor	1.2	2.2	3.1	3.6
G	Poor	1.2	2.1	3.3	4.2

From the above we conclude a constancy in yield power is to be expected from each clone. However, we also are forced to note that a basic selection of clones is necessary. From 1921, the HAPM staff set out its seed nurseries with wider spacing than usual, bud grafted the seedlings, then forced the budding to develop, and when the buddings were about three years old they were test tapped. All subsequent budding material that was to be used for multiplication of the best yielders came from those clones in the nurseries which recorded the highest yields. Test tapping is the only means known at present to predict the quality of a clone with respect to yield.

Buds obtained from the one-year-old shoots of the clones selected in the nursery by test tapping were found satisfactory for use as planting material or for multiplication of such clones in the nurseries. And thus was established a method to get an unlimited supply of planting material of the best known yielding capacity—pedigreed stock, in other words. Since 1923, HAPM has used about six selected clones for planting new areas. As a measure of safety, these six clones have been mixed in any given area. As a further caution, the policy is followed of interplanting buddings with seedlings grown from seeds derived from superior clones.

### Is It Safe to Plant Buddings Alone?

Experience with buddings is too recent to justify broad conclusions and a fixed policy. Tapping of buddings has extended over four years only. Nothing is known so far as to bark renewal. Clones will require careful observation over a long period. It has not been all smooth sailing. It has been found that certain clones displayed particular weakness against disease; other clones showed a distorted renewal tapping surface with protuberances similar to brown bast effects; other clones failed to show a gradual normal increase in yield, even declining in yield in some instances. These illustrations suffice to prove that caution must be exercised in selecting the clones which will determine the final character of the trees on the plantation. Sufficient progress, however, has been made with buddings to warrant the belief that they offer a very satisfactory means of improving the character of rubber trees at present found on all plantations in the Middle East. The method outlined above is a practical one that may be made use of on present estates. There are estates perhaps in British Malaya which could produce clones superior to those reported from the United States Rubber Plantations. It may be possible to produce extraordinary yields from clones derived from exceptional trees in the high plateau region of the Upper Amazon.

Proved clones are at present restricted to only a few estates. Even where they do exist they must be multiplied many times for large scale opening. To start from the beginning takes time. Allowing two years for basic selection of mother trees, five or six years for development of clones and test tapping, and two years for multiplying the proved clones on a sufficiently large scale means at least ten years. A couple of years could be saved by not test tapping in the nurseries, leaving the rejection to thinning operations in the field.

There are advocates of seedlings as a better bet. They claim that a seedling having its own root system will do better than a budding. They insist it is better to establish buddings in isolated areas. Then when these buddings develop, the seed derived from them as a result of self or cross-pollination from the same clone will reproduce all the characteristics of the mother tree. These contentions are quite plausible. There is room for both methods and doubtless both systems will be used to mutual advantage. One thing is certain—the old haphazard method of planting is no longer justifiable.

FINLAND'S IMPORTS OF RUBBER BELTING INCREASED FROM 132,400 pounds in 1924 to 175,300 pounds in 1926, according to statistics furnished by the Department of Commerce. Four factories produced all kinds of belting, with an approximate value of \$249,900, the principal producer of rubber belting being the Suomen Gummitehdas O/Y Nokia.

## Simplification of Tire Sizes

A summary of tire sales data submitted to the Department of Commerce by principal tire manufacturers furnishes some interesting facts, according to the following statistics prepared by R. M. Hudson, chief, Division of Simplified Practice:

In the list to car manufacturers only three sizes have held a place among the ten most popular sizes each year from 1924 to 1927, inclusive. They are the 31 by 5.25, the 33 by 6.00 and the 30 by 5.25. The 29 by 4.40 has held first place in 1925 and 1926 and thus far in 1927; the 29 by 4.75 stood sixth in 1926 and is in third place this year; and the 32 by 6.00 has moved up from ninth to sixth place in the same period.

It would seem logical, therefore, in any proposed simplification program to perpetuate these six sizes. The sizes appearing the first time in the 1927 list, such as the 31 by 5.00, 28 by 4.75, 31 by 6.00 and 30 by 6.00, who knows whether or not they will survive another season? Granting the trend in car design favors the smaller sizes, what assurance is there to the public that these newer tire sizes are any more correct than others that have come and gone in previous years?

There is a splendid opportunity in the present great diversity of balloon sizes for the car manufacturer to render a great service to the motoring public, the tire dealers and the manufacturers, as well as himself, by cooperating in the establishment of a relatively permanent simplified list of sizes as the basis of future original equipment. Thirty-seven or more current sizes scattered over ten cross sections and five different wheel sizes seem unnecessary when practically 80 per cent of the 1927 sales to manufacturers comes from five of these sizes.

The automotive industry can easily add to its prestige by co-operating with the 200 tire manufacturers, the 100,000 tire dealers and the 22,000,000 motorists by simplifying its tire sizes.

#### TEN MOST POPULAR TIRE SIZES AS INDICATED BY VOLUME OF SALES FOR 1924-1927

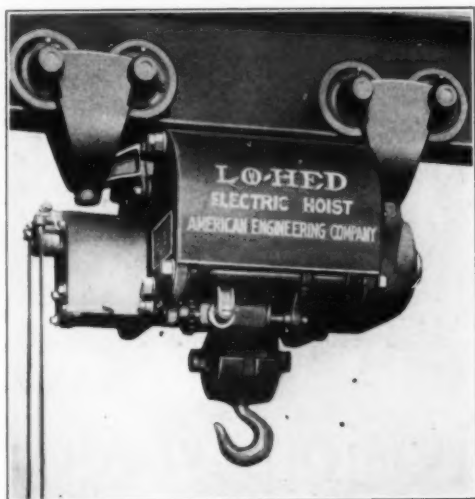
	TO CAR MANUFACTURERS			First Five Months of 1927
	1924	1925	1926	
1 .....	31x5.25 (386,807)	29x4.40 (4,023,647)	29x4.40 (5,238,997)	29x4.40 (2,341,120)
2 .....	30x5.77 (292,685)	30x5.77 (1,208,455)	31x5.25 (1,603,783)	31x5.25 (561,053)
3 .....	32x5.77 (208,385)	33x6.00 (1,050,887)	33x6.00 (948,916)	29x4.75 (359,042)
4 .....	32x6.20 (199,929)	31x5.25 (912,370)	30x5.25 (721,422)	31x5.00 (306,614)
5 .....	31x4.95 (158,730)	30x4.95 (649,522)	30x4.75 (547,076)	33x6.00 (220,087)
6 .....	31x6.20 (114,337)	30x5.25 (443,801)	29x4.75 (414,672)	32x6.00 (200,655)
7 .....	33x6.00 (96,595)	29x4.95 (326,962)	30x4.95 (335,145)	28x4.75 (179,997)
8 .....	30x5.25 (90,810)	32x6.20 (279,874)	30x5.77 (197,197)	31x6.00 (151,388)
9 .....	34x7.30 (45,107)	32x5.77 (261,609)	32x6.00 (187,551)	30x5.25 (133,672)
10 .....	33x5.77 (32,430)	33x6.75 (154,067)	27x4.40 (131,366)	30x6.00 (94,618)

#### TEN MOST POPULAR TIRE SIZES AS INDICATED BY VOLUME OF SALES FOR 1924-1927

	TO DEALERS AND EXPORT			First Five Months of 1927
	1924	1925	1926	
1 .....	29x4.40 (499,526)	29x4.40 (1,262,874)	29x4.40 (2,652,486)	29x4.40 (1,862,915)
2 .....	31x5.25 (131,841)	30x5.77 (316,992)	31x5.25 (690,380)	31x5.25 (417,463)
3 .....	31x4.40 (81,305)	31x5.25 (284,239)	33x6.00 (400,114)	33x6.00 (275,914)
4 .....	32x6.20 (76,297)	31x4.40 (153,210)	30x5.77 (368,804)	30x5.25 (158,135)
5 .....	33x6.20 (48,720)	32x6.20 (138,881)	30x5.25 (289,454)	30x5.77 (151,289)
6 .....	33x4.95 (38,984)	33x6.00 (133,949)	30x4.95 (193,150)	31x5.00 (107,439)
7 .....	31x4.95 (36,499)	30x4.95 (132,225)	32x6.20 (147,873)	32x6.00 (98,617)
8 .....	30x5.77 (29,846)	31x4.95 (106,601)	30x4.75 (142,567)	29x4.75 (96,023)
9 .....	32x5.77 (29,472)	32x5.77 (103,603)	31x4.95 (116,682)	30x4.75 (89,312)
10 .....	34x7.30 (26,810)	30x5.25 (79,277)	29x4.75 (110,962)	30x4.95 (76,816)

### MONO-RAIL HOIST

An exceptional hoist built in half-ton and ton sizes is here pictured. It is of the low head room class and is mounted on an 8-wheel trolley which greatly reduces the head room. The standard height of lift is 20 feet but 25 feet can be provided. Four ropes are used. Remote control of both hoist and trolley motors is possible. The hoist is designed for work in crowded spaces where



Lo-Hed Electric Hoist

clearance is limited. This feature permits stacking materials to greater height in warehouse and factory storage rooms.

The hoist travels around curves of short radius, shifts easily over switches and is protected from dust and moisture by metal covers. The motors are ball bearing, specially designed for hoisting service and are fully protected. The mechanical efficiency is over 80 per cent. The drive between the motor and drum is of the spur gear type and runs in oil. Alemite lubrication is used for all bearings not automatically lubricated by the oil bath. Full control of the hoist is maintained at all times by holding and lowering brakes. There is provided also a positive acting upper limit device to insure safety in operation.—American Engineering Co., Philadelphia, Pennsylvania.

### OUTLOOK OF THE RUBBER CHEMIST

The "Lewis Monroe Dennis Quarter Century Volume" to be published in commemoration of the completion by Professor Dennis of 25 years' service as head of the Department of Chemistry at Cornell University, will contain an article on Rubber Chemistry,<sup>1</sup> by Dr. William C. Geer, formerly vice president in charge of Research and Development, The B. F. Goodrich Co., Akron, O.

Following a review of the complex problems of the rubber chemists and their notable achievements, Dr. Geer concludes with the following concerning the outlook of the rubber chemist:

As the rubber chemist looks into the future he fears no rubber or reclaimed rubber shortage, for I venture the prediction that reclaimed rubber will be improved and larger amounts be used. The present producing capacity for reclaimed rubber is 227,000 tons per annum,<sup>2</sup> and because of a much larger and increasing tonnage of scrap available, it will for long years serve as an effective balance of power in the contest between planter and consumer.

He need not call upon an imperfect synthetic rubber at a high price to help in this problem of supplies to carry the automobiles of this country. The growth of rubber bearing shrubs and plants—

such as from the splendid botanical and chemical work with guayule rubber—will give us generous amounts of crude from our own soil, although one cannot entertain the thought that the English and Dutch plantations will cease to be powerful factors in the crude rubber situation.

The tire may be improved through chemical research, but the engineers must need catch up with the chemist during the next decade. When the number of sizes and brands is reduced, we may undertake the task of further advance in service value.

The accelerator is certain to show improvement and the anti-oxidant come into greater moment as a preservative to the life of rubber articles.

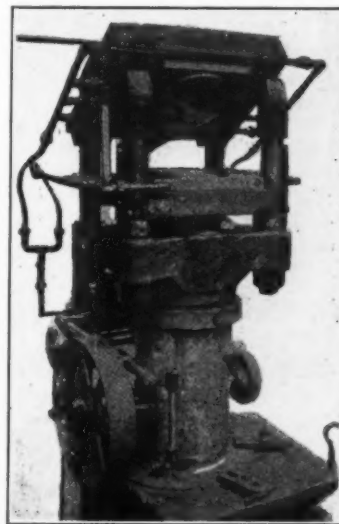
And an extended new field will be in the use of rubber as a structural material; many parts of automobiles not now given consideration will be made of some rubber mixture worked out by the chemist for some particular use.

The airplane is rapidly coming into its own, and those who fly place notable reliance upon vibration and shock absorbing members, made of rubber. The light, strong, resilient tires and shock absorber cord take up the heavy percussions of the start and the landing. Less noticeable, albeit perhaps more essential, are bits of rubber to prevent gasoline, oil, and water lines from shaking apart. Something at least to the safety of transoceanic flights has been contributed by rubber.

We are on the threshold of a new era. Will rubber play a prominent part as with the automobile? Without doubt. Rubber tubing insoluble in gasoline and oil will be produced; rubber paints to which water and ice will not cling; lighter and better tires; these are but random thoughts. We are sure, however, that the usefulness of rubber will be enhanced over the future only if those who construct the machine will take into their confidence the rubber chemist. These, then, in a spirit and reality of cooperation may work together to draw from the infinite possibilities of rubber those special compositions which will fill the essential and changing need of the future.

### AUTOMATIC VULCANIZING PRESS

A German automatic vulcanizing press for molding hollow articles such as bathing caps, hot water bottles, balls, etc., is here pictured. The mold halves are secured to the upper and lower platen of the press. The lower platen is hydraulically actuated and the upper one by mechanical action is folded backward to open the press and forward to close and lock the molds in exact registration.



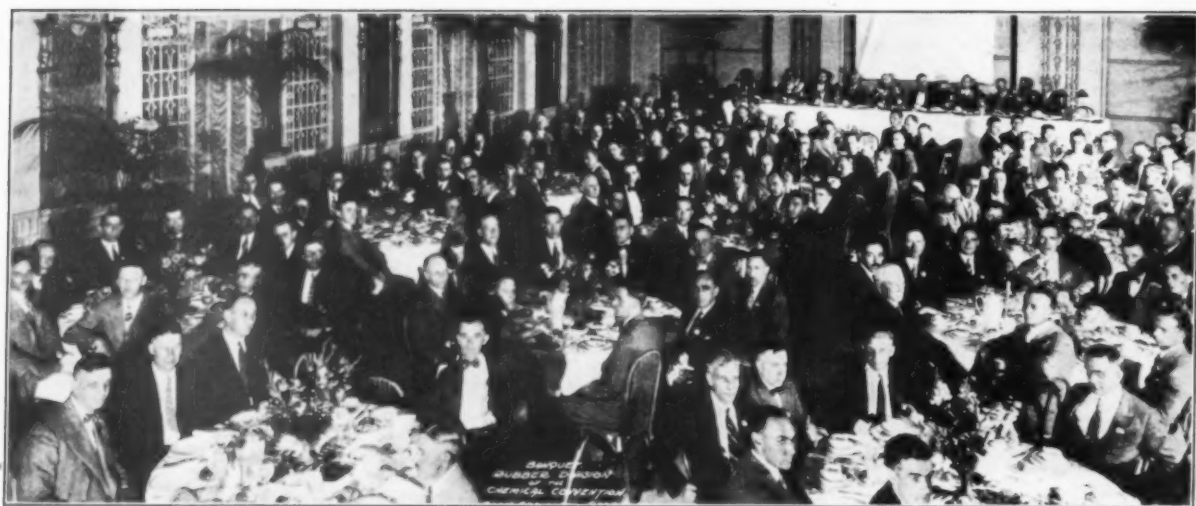
Berstorff's Molding Press

In operation, the attendant has only to engage a clutch coupling by means of the action of a foot treadle. The mechanism thus set in motion serves to close the press and the process of molding and curing the article takes place automatically, including opening the press at the end of the set cure.—Hermann Berstorff, G. m. b. H., Hannover, Germany.

EXPORTS OF AUTOMOBILE CASINGS FROM THE UNITED KINGDOM to foreign countries during the first six months of 1927, according to the Department of Commerce, numbered 525,734, valued at £1,269,864.

<sup>1</sup> Reprinted from *Ind. Eng. Chem.*, Oct. 1, 1927, pp. 1095-99.

<sup>2</sup> Department Commerce, Rubber Division, Special Circ., 1501.



Rubber Division Banquet Held September 8 at the Book-Cadillac Hotel, Detroit, Michigan

## A. C. S. Rubber Division Meeting

**T**HE Seventy-fourth Meeting of the American Chemical Society was held September 5 to 10, 1927, at Detroit, Michigan, where three sessions of the Rubber Division occurred. The attendance of rubber chemists reached 250 and the interest was well sustained throughout.

The annual business meeting of the division preceded the reading of papers at the first session and the following officers were elected for the ensuing year: Harry L. Fisher, chairman; Arnold H. Smith, vice chairman; H. E. Simmons, secretary-treasurer. Executive committee: Harry L. Fisher, chairman, *ex officio*; Stanley Krall, E. R. Bridgwater, W. G. Nelson, H. B. Pushee, John Fry, H. A. Winkelmann.

It was voted to establish local groups of the division at points convenient to rubber manufacturing centers. The Executive Committee will select the locations. Four locations were suggested, namely: Akron, New York, Boston and Los Angeles or San Francisco. Group organizations will be subsidiary to the parent organization, and hold monthly meetings at which one or two papers only will be read in order to allow time for full discussion.

A progress report of the Physical Testing Committee was read and accepted. It will be published shortly for the benefit of the rubber industry.

The Executive Committee announced that the Rubber and Organic Chemistry Divisions will hold a joint symposium on polymerization at the spring meeting to be held next year at St. Louis, Missouri.

### Rubber Division Dinner

A large gathering of rubber chemists and their friends assembled for the group dinner held in the Italian garden ball room of the Book-Cadillac Hotel, Thursday, September 8. The speaker of the evening was Dr. Carl Arnstein, vice president of The Goodyear Zeppelin Corp., Akron, Ohio. He spoke most interestingly on the development and design of lighter-than-air-craft. Dr. Arnstein has been identified since 1913 with designing Zeppelin airships, and in his present connection is in charge of the design and construction of the proposed Zeppelin of 6,500,000 cubic feet capacity to be built by The Goodyear Zeppelin Corp.

### Abstracts of Papers — Reclaim Symposium

**Pigment Reinforcement of Reclaimed Rubber.** The reinforcing action of pigments on reclaimed rubber has been studied by compounding a whole tire reclaim with carbon blacks, zinc oxides, clays, barytes, whiting, etc. In view of the wide use of reclaimed rubber in all types of compounds, it is of considerable importance to know the effect of the various pigments on the physical properties of the manufactured product. The high degree of disaggregation of reclaimed rubber makes the choosing of pigments for maximum reinforcing value even more important than is the case with crude rubber. The order of effectiveness of the pigment is the same as that for crude rubber except that there is a wider gap between reinforcing and non-reinforcing pigments.—H. A. Winkelmann and E. G. Croakman.

**Effect of Using High Sulphur vs. Low Sulphur in Vulcanizing Reclaim.** The writers are attempting to prove that there is an optimum percentage of sulphur to be used in connection with vulcanizing reclaimed rubber to give the best physical

results. We have worked this out giving thought to obtaining maximum qualities out of reclaimed rubber on type compounds and on the straight reclaim itself. Particular stress is being laid in this paper on the curing of tread compounds showing the effect of the different percentages of sulphur on the same time of cure.—R. E. Cartledge and H. L. Snyder.

**The Value of the Rubber Hydrocarbon in Reclaim.** A series of tire tread stocks containing varying amounts of reclaim were compounded in such a manner that the ultimate composition of all stocks was the same, the only variable being the percentage of reclaimed rubber hydrocarbon substituted for new rubber hydrocarbon. Cures were adjusted to give the technical optimum in the same time of cure. The cured stocks were subjected to tensile tests and abrasion tests by five different methods. The results show that the value of the reclaim rubber hydrocarbon varies from zero, when substituted in small percentages, up to a maximum of 50 per cent of the value of new rubber when compounded in large percentages.—W. W. Vogt.

**Rate of Cure of Reclaimed Rubber.** Data are presented emphasizing the well-known fact that reclaimed rubber vulcanizes at a very much more rapid rate than new rubber, and also that even in small concentration in a new rubber stock it materially increases the rate of cure. Possible reasons for this are discussed and experimental evidence given to show the influence of the residual alkali in the reclaim, and the effect of the heat treatment in itself. Neither of these explains the rapid rate. The need for, and methods of, compensating for this rapid rate of cure in compounding with reclaimed rubber are discussed with special emphasis on the influence of the rapid rate of cure on the aging characteristics of a rubber stock.—Norman A. Shepard, Henry F. Palmer, and George W. Miller.

**Factors in Processing Reclaimed Rubber.** Production of reclaimed rubber of uniformly good physical and chemical properties is dependent first upon judicious classification and blending of raw materials. Grinding to a state in which no large particles are present, but without an excess of fines, allows a minimum devulcanizing time at a given temperature, decreases the tendency to depolymerize to an objectionable extent, and reduces the requirement for softeners. These conditions facilitate farther processing to a smooth product of good quality with the desired plasticity and with optimum compounding, milling, calendering and tubing characteristics. Devulcanization at high temperatures tends to reduce slightly the tensile and to increase the elongation as compared with treatment at lower temperatures. "Alkali" reclaims require efficient washing to remove residual caustic and the recovery of fines from the wash liquors involves problems of settling and filtration or screening. Drying of wet processed reclaims at high temperatures or for an excessively long time results in "tacky" products just as does overdevulcanization. A minimum amount of milling and refining at normal temperatures is desirable to preserve the quality, therefore previous processing should be thorough and uniform. Some comparisons of type of equipment are made and some desirable future developments are discussed.—P. S. Shoaff.

### General Papers

**Effect of Certain Metallic Salts on the Aging of a Tread Compound.** The effect on aging of a tread compound produced by the addition of low concentrations of iron, copper, manganese and mercury salts of higher aliphatic organic acids was investigated. The data obtained from aging in the Bierer-Davis bomb show that the presence of the copper and manganese salts in very small concentrations is harmful to the aging of rubber. The bomb test at 70 degrees C. was much more severe than the oven test at the same temperature.—Bert S. Taylor and Webster N. Jones.

**An Analysis of a Typical Angle Abrasion Machine.** The machine employed consists of a driven abrasive wheel, the rubber test piece in ring form being pressed against the flat face of the wheel in such a manner that the plane of the ring makes an angle with the tangent of the abrasive wheel at the spot of contact. Provision is made for measuring the power consumed in abrasion by a Prony brake method. This angle machine is essentially a constant power machine. The relationship between abrasion loss and time, load, speed, angle, power consumption, etc., are given. An analysis of the forces involved is also given.—W. W. Vogt.

**Effect of Amphoteric Metallic Salts on Rubber.** Isomers of rubber have been prepared by heat treatment with certain anhydrous salts of amphoteric metals (Jones and Winkelmann, Canadian patent No. 267,116, 1926). These products have greater heat plasticity and less chemical unsaturation than rubber. The nature of the product obtained may be controlled by varying concentration, time, and temperature of treatment, as well as the character of the reagent. These isomers, depending upon condition of preparation, are soft resembling

chicle, tough resembling gutta percha or hard and brittle resembling shellac.—H. W. Winkelmann and Webster N. Jones.

**Influence of the Sulphur-Rubber Ratio on the Physical Properties of Hard Rubber.** Sulphur-rubber ratios from 30 to 45 appear to cover the entire range necessary for hard rubber compounds. Below a value of 30 the rubber has little strength and undergoes great deflection; above 45 the gain in strength is doubtful. Physical strength tests (tensile, transverse, and impact strengths), and deformation under heat tests are used as a basis of comparison. The tensile and deformation under heat tests are believed to be of the most value. It is hoped that these tests may be suitable for selecting rubber for various applications and for use in specifications for hard rubber.—David E. Pearsall.

**A Hardness Tester for Rubber.** An instrument has been developed for measuring the hardness or penetration of vulcanized rubber. This device consists of a steel rod with spherical point under pressure of a coiled spring, mounted in a suitable case with a gage graduated in thousandths of an inch. The total motion of the steel rod is 100 divisions on the gage or 1/10 inch. This instrument has been tested out thoroughly over a period of several years and found to be reliable, accurate, convenient to operate, and to give results which are reproducible.—Erle C. Zimmerman and Roy W. Brown.

**Effect of Ozonized Oxygen on Stretched Rubber.** The cracking of rubber can be accelerated by subjecting it when stretched to the action of ozonized oxygen. Unstressed rubber tensile strips subjected to the action of ozonized oxygen continuously for eighteen hours did not change much in tensile, but when stretched even a very small amount they cracked very quickly. The very interesting observation was made that there is a critical elongation for each compound at which it deteriorates most rapidly.—F. L. Haushalter and Webster N. Jones.

**Aging of Stretched Rubber.** Vulcanized rubber under stress ages more rapidly than unstressed rubber. The sunlight aging of a number of stocks under tension has been investigated. In the case of a pure gum stock sunlight aging was compared with Geer oven, Bierer bomb, and ultra-violet light aging. The rate of deterioration of stretched rubber is not proportional to the degree of stretch in the early stages of exposure to sunlight. There appears to be a critical elongation for each stock at which the deterioration progresses more rapidly than any other.—Arthur Kelly, Bert S. Taylor, and Webster N. Jones.

**An Analysis of Natural and Artificial Aging of Rubber.** The natural aging of rubber is considered as an oxidation, an after vulcanization, and a colloidal phenomenon. Data are given to show the effect of these actions separately insofar as this is possible. The effect of the natural anti-oxidant, the effect of free and combined sulphur on the rate of oxidation, and the secondary anti-oxidant effects of accelerators are discussed. Some data relative to after vulcanization are presented and a study of various standard methods of artificial aging is made with reference to the factors which are predominant.—W. W. Vogt, L. B. Sebrell, and S. M. Martin, Jr.

**Effect of Heat on Crude Rubber.** The effect of heating crude rubber at 153 degrees C. under pressure has been studied as to the effect upon plasticity, rate of cure, physical properties, chemical characteristics, and chemical constitution of the non-rubber constituents. It is shown that hydrolysis takes place causing an increase in rate of cure in some cases and a slowing up in others, depending upon the type of rubber and the accelerator used. A change in shape of the stress-strain curve is noted, also a change in the nitrogen distribution and an increase in the acid number. The effect on aging is negligible. Investigation of the water extract of hydrolyzed rubber led to the isolation of several fractions having marked accelerating and activating effects. The action of various plant substances during the cure was investigated.—C. R. Park, C. M. Carson, and L. B. Sebrell.

# EDITORIALS

## *Our Front Cover*

THE front cover of INDIA RUBBER WORLD this month incorporates changes in line with many and repeated suggestions from members of the trade.

A possible cover revision in keeping with so-called "modern practices" has been obvious, of course, but one hesitates at any time to relinquish lightly what has served well for two generations.

Progress in any endeavor, however, must often ride rough-shod over the lure of pure sentiment. Today, the rubber industry, itself, would find difficulty in recognizing the business of forty years ago.

Therefore, INDIA RUBBER WORLD, through its "dress" and makeup as well as its contents, will be made to reflect a true picture of the progress of the industry it serves.

## *Hand-to-Mouth Buying*

A STRIKING instance of favorable results while pursuing a hand-to-mouth or requirement buying policy is set forth in the report of a survey recently made by the Bureau of Business Standards. After comparing present with prewar conditions, and noting a general improvement, particularly in the turnover of raw materials, it is stated that "one manufacturer [name not given] whose chief crude stock is rubber reports: 'In 1920 we manufactured 79,148 tons of merchandise on a \$10,000,000 stores and material inventory; in 1923, 98,839 tons with a \$5,000,000 inventory; in 1926, 143,296 tons with a \$4,000,000 inventory; and yet our raw materials, particularly rubber, cost us more in 1923 than in 1920, and still more in 1926.'" Thus it is seen that while the inventory dwindles, the output increases.

## *Modern Factory Equipment*

CHEAPER labor, lower taxes, and a milder clime but partly account for southern factory growth and northeastern decline. Recently a research committee visited a New England mill whose managers had complained bitterly of high costs and hard times; and they found the chief fault lay in antiquated machinery, equipment bought 52 years ago. Perhaps here lies a lesson for rubber manufacturers who also deplore inability to compete. Were they to have their troubles thus analyzed the chances are that out-of-date equipment would prove to be the chief impediment to their success. Rubber goods making, like any other business, must either progress or retrograde; and a heavy handicap in the race for trade is rubber machinery more suited to the days of clipper sailing ships than to those of sea-spanning airplanes.

## *A Rubber Geneva Conference*

TO disinterested lookers-on the rubber planting and manufacturing interests doubtless seem like Siamese twins, who, though they cannot get on without each other, yet constantly chant, "Cursed be the tie that chafes." Each, like the man who caught a Tartar, also finds that the Tartar has caught him. Meanwhile, the planter prays for a Moses to lead him out of the house of bondage, for he finds that his fortunes are intimately bound up with those of one branch of the rubber industry, tire manufacturing, which absorbs the bulk of his product. Try to control output as he may, yet the tire maker seems to outwit him with buying pools, conservation, large use of reclaimed rubber, and other "devious" devices. The prospect for finding some other great outlet for crude rubber, even through the use of a quarter of a million dollars yearly for research and propaganda, remains but a receding mirage.

On the other hand, the tire maker frets at the marketing restraints imposed in asserted self-protection by the rubber raiser. He is impatient of any foreign selling monopoly in basic material, and he longs to be rid of what he regards as a millstone about his neck. Eagerly he yearns, and to some extent plans, for emancipation and his own supply. Nor does he find much comfort in reports that the planter increasingly doubts the efficacy of restriction and even fears a return in about three years of conditions that caused the crisis of 1921-22, and all as the result of new planting.

Outsiders wonder why relations between these two great divisions of the rubber industry should continue to be strained when the two are so essential to each other, and easily he can conjure up a disaster were either to concertedly attempt to embarrass the other. Surely, he reasons, there must be a happy middle course for both sides to pursue, some *modus vivendi* that might be tried out fairly in an earnest endeavor to not merely overcome needless antagonism but to provide justly profitable operations for both over a long period. There are such big minds on both sides, that the wonder is that this difficulty has not been solved with a simple workable convention. Perhaps the rubber industry may soon have a Geneva conference of its own at which all related problems will be fully considered, with the result that a simple understanding may be reached and an agreement effected that will insure lasting harmony, stability, and advantage for the whole industry.

\* \* \*

A BRITISH FIRM HAS PATENTED A RUBBER CATGUT that may be used on banjos. Now, with something else in rubber to pick on, restrictionists should feel much relieved.

# American Rubber Technologists

Technical superintendents, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication

**CLAYTON OLIN NORTH**, chem. engr. b. Oct. 31, 1891, Dubois, Pa.; Carnegie Inst. of Tech., B. Sc., 1914, chem. engr., 1927; analyst and research work, Republic Rubber Co., Youngstown, O., 1914-1916; compounding and research, Goodyear T. & R. Co., Akron, O., 1916-1921; secy., treas. and development mgr., Rubber Service Laboratories Co., Akron, O., since 1921. *Author*: Various papers on compounding ingredients, mineral rubber and various patents on accelerators of vulcanization. *Member*: Amer. Inst. of Chem. Engrs., Amer. Chem. Soc., Portage Country Club and Akron City Clubs, Akron, O.; Chemists Club, New York, N. Y. *Address*: Rubber Service Laboratories Co., Akron, O., also Nitro, W. Va.

**Arnold R. Davis**, chem. engr. b. Oct. 31, 1900, Montville, Me.; S. B. in chem. engr. M. I. T. 1921; asst. chem., Firestone Footwear Co., Hudson, Mass., 1921, and chf. chem. since 1924. *Member*: Amer. Chem. Soc., Inst. of Rubber Indus. (England), Mason. *Address*: 54 Lincoln street, Hudson Mass.

**Charles G. Miller**, chem. engr. b. May 31, 1891, South Bend, Ind.; B. S. in chem. engr. Purdue U., 1914; analyst, Pennsylvania R. R., Altoona, Pa., 1915-1916; chem., Racine Rubber Co., Racine, Wis., 1916-1920; chf. chem., McClaren Rubber Co., Charlotte, N. C., 1920-1924, fact. mgr. since 1924. *Member*: A. S. T. M., Amer. Chem. Soc. *Address*: 2015 Dilworth Rd., East, Charlotte, N. C.

**Harold Arthur Morton**, chem. b. Dec. 25, 1890, Worcester, Mass.; A. B. Clark Coll. 1912; A. M. Clark U., 1913; Ph. D. chem. research, U. of Pittsburgh, 1915; Fellow at Mellon Inst., Pittsburgh, Pa., 1915-1920; director of research, Miller Rubber Co., Akron, O., since 1920. *Author*: Papers and patents on sugars, acetaldehyde, acetone, acetic acid, catalysts, paraldehyde, vulcanization of rubber, accelerators, etc. *Member*: Amer. Chem. Soc., Torch Club, Akron, O. *Address*: 475 Dorchester Rd., Akron, O.

**David E. Pearsall**, chem. engr., b. Feb. 2, 1899, Brookville, Pa.; B. S., U. of Pa., 1922; chem. engr., experimental laboratory, Atlas Powder Co., Tamaqua, Pa., 1922-1923; chem. engr., Vulcan Detinning Co., Pittsburgh, Pa., 1923-1926, chem. engr. development branch, hard rubber compounds, Western Electric Co., Hawthorne Works, Chicago, Ill., since 1926. *Member*: A. C. S., A. A. S., First Lt. C. W. Reserve, U. S. A., Chicago Geographic Soc., Sigma Pi. *Address*: 304 S. Ashland avenue, La Grange, Ill.

**Philip A. Ritter**, chem. b. Nov. 9, 1890, Milwaukee, Wis.; B. S., U. of Wis., 1916; asst. chem., B. F. Goodrich Co., Akron, O., 1916-1918; chf. chem., Federal div., Fisk Rubber Co., Cudahy, Wis., since 1918. *Member*: A. C. S., Phi Lambda Upsilon. *Address*: 551 Wentworth avenue, Milwaukee, Wis.

**Archie Reed Kemp**, chem. b. Apr. 24, 1894, Groton, S. Dak.; B.S., 1917, M.S. 1918 Calif. Inst. of Tech.; research chem., Western Electric Co., Chicago, Ill., 1918-1925; Bell Telephone Labs., New York, N. Y., since 1925. *Author and Coauthor*: Papers on organic and inorganic chemistry, "Submarine Insulation with Special Reference to Rubber," "A Modified Wijs Method for Direct Determination of Rubber." Various patents relating to the submarine cable field. *Member*: Amer. Chem. Soc., Mason. *Address*: 170 Lexington ave., Westwood, N. J.

**Kingsley Gillespie**, chem. engr. b. August 15, 1895, Stamford, Conn.; S.B. in chem. eng. M. I. T., 1917; research nitro-starch explosives for hand grenades at the eastern lab. E. I. duPont de Nemours & Co.; lieut., Chlorine Products Dept., C. W. S., Edgewood Arsenal, Baltimore, Md.; technical mgr. factice plant, Stamford Rubber Supply Co., Stamford, Conn., since 1919. *Author*: Treatise, "Measurements of Quality of Factice." *Member*: Amer. Inst. Chem. Engrs., secretary, Stamford Rotary Club, Army Ordnance Asso. *Address*: 117 Prospect street, Stamford, Conn.

**James Edward Skane**, mech. eng. b. 1891, Oldham, Eng.; La Salle Academy, Providence, R. I.; B.S. in mech. eng., Brown U. 1916; post graduate work in organic chem. 1917; phys. lab., U. S. Rubber Co., 1916-19; asst. supt. rubber dept., Amer. Wringer Co., 1919-1920; chf. engr. of belt development, fabrics and yarns, Manhattan Rubber Mfg. Co., Passaic, N. J., since 1920. *Member*: Phi Kappa. *Address*: 88 Raid avenue, Passaic, N. J.

**James Lomax Clark**, chem. b. Oct. 6, 1894, Newton, Mass.; B.S., M. I. T. 1920; Manhattan Rubber Mfg. Co., 1920-1921; Celluloid Co., Newark, N. J., 1921; compounding in laboratory, Manhattan Rubber Mfg. Co., since 1921. *Member*: Amer. Chem. Soc.; Chi Phi. *Address*: 243 Orange Road, Montclair, N. J.

**Thomas Franklin Carey**, chem. b. Oct. 4, 1886, New York City, B.S. Brooklyn Polytechnic Inst., 1909; graduate work Columbia U. 1909-1910; instructor chem., N. Y. U. 1909-1910; chem., Lackawanna Steel Co., Buffalo, N. Y., and Amer. Agric. Chem. Co., Wilmington, Del. 1910-1911; rubber chem., Electric Cable Co., Bridgeport, Conn., 1911-1917; fact. supt., Quabang Rubber Co., North Brookfield, Mass., 1918; mgr. hose dept., Manhattan Rubber Mfg. Co., Passaic, N. J., since 1918. *Member*: Mason and Shriner. *Address*: 89 Linwood avenue, Ridgewood, N. J.

**Robert H. McLeod**, engr. b. 1886, Eau Claire, Wis.; M. E., Columbia U., 1912; draftsman, Tenn. Copper Co., 1912; engr. Canton Electric Co., 1913-1915; asst. mech. engr. and supt., Phila. Rubber Works Co., 1916-1919; supt. reclaiming dept., Manhattan Rubber Mfg. Co., Whippany, N. J., since 1920. *Address*: P. O. Box 326 Morris Plains, N. J.

**Carl Duncan Kennedy**, chem. engr. b. Jan. 16, 1887, Concord, N. H.; B. S., U. of N. H., 1909; asst. chem. Mass. Agri. Expt. Station, 1909-1910; chem., Continental Mexican Rubber Co., Torreon, Mex.; and Rubber Exploration, Ecuador, Peru and Brazil, 1911-1913; chem. and fact. mgr., U. S. Rubber Plantations, Sumatra, N. E. I., 1914-1921; development work, U. S. Rubber Co., New York, 1922-1924; development work, Henderson, Helm, Inc., New York, since 1925. *Member*: A. C. S., Soc. of Chem. Indus. (Eng.), Kappa Sigma, B. P. O. E., Masonic bodies. *Address*: Henderson, Helm, Inc., 44 Beaver street, New York, N. Y.

**Paul De Witt Gephart**, chem. engr., b. Nov. 16, 1896, Franklin, O.; chem. engr., Ohio State U., 1920; junior fellow, Mellon Inst. Indus. Research, 1920-1924; eastern representative, M R and Asphalt Specialties Depts., H. H. Robertson Co., Pittsburgh, Pa., since 1924; *Author*: researches on asphalts, rubber compounding, roofing, and several patents. *Member*: A. S. T. M., A. C. S., Acacia Fraternity, Alpha Chi Sigma, Masonic bodies. *Address*: Pitt Faculty Club, Pittsburgh, Pa.

**Harold Baldwin Pushee**, chem. b. Jan. 6, 1890; S. B., M. I. T., 1911; asst. chem. Goodyear T. & R. Co., Akron, O., 1911-1915; chf. chem. General T. & R. Co., Akron, O. *Member*: Amer. Chem. Soc., Elks. *Address*: 261 Dixon Place, Akron, Ohio.

**Carl Albert Anderson**, mech. engr. b. Jan. 18, 1901, Dover, N. J., M. E., Stevens Inst. Tech., 1922; asst. supt. Bloomingdale Rubber Co., 1923-1925; asst. supt. reclaiming dept., Manhattan Rubber Mfg. Co., Whippany, N. J. *Member*: Chi Psi. *Address*: 125 Mt. Hope avenue, Dover, N. J.

**Ray Watts**, mech. engr. b. Jan. 9, 1901, River Edge, N. J., M.E., Brooklyn Polytechnic Inst., 1924; departmental engr. Manhattan Rubber Mfg. Co. since 1924. *Author*: Thesis "Design and Construction of an 8-inch Impulse Turbine." *Member*: A. S. M. E. *Address*: River Edge, N. J.

**Ezra Lloyd Hanna**, chem. b. June 29, 1893, Akron, O., B.S., Municipal U. of Akron, 1915; chem., Star Rubber Co., Akron, O., 1915-17; chf. chem., Davol Rubber Co., Providence, R. I. since 1917. *Member*: Amer. Chem. Soc.; Masonic bodies; Zeta Alpha Epsilon. *Address*: North Sitate, R. I.

**William Henry Brawley**, chem. b. July 24, 1891, Boston, Mass.; A. B., Harvard U., 1913; U. S. Rubber and subsidiary companies, compound development dept., Firestone Tire & Rubber Co.; chf. chem. Iowa Cord Tire Co.; supt., Panther Mfg. Co.; supt. Plant B Lancaster Tire & Rubber Co., Lancaster, O.; Corporal, C. W. S. U. S. A., rubber technologist, mechanical research and development division on gas masks; New Eng. representative, Vansul Inc., New York, N. Y. *Member*: Asso. of Harvard Chemists, Harvard Club of Medford, Mass. *Address*: 77 Mystic street, Medford, Mass.

# What the Rubber Chemists Are Doing

IN the earlier days of rubber chemistry the coefficient of vulcanization—that is, the percentage of chemically combined sulphur calculated to 100 parts rubber hydrocarbon—was considered an index of considerable importance in determining the state of cure. Furthermore, various investigators<sup>1</sup> established the fact that in the ordinary types of soft rubber mixtures vulcanized at constant temperature for different periods of time the coefficients of vulcanization are directly proportional to the time of heating up to a point where the free sulphur approaches exhaustion.

With the advent of organic accelerators it was early realized that the old idea that correctly vulcanized rubber should have a coefficient of 3 to 5 was no longer true. It was further discovered that different accelerators, even when used in proportions that would give equivalent physical cures under the same condition of vulcanization, did not produce the same coefficients of sulphur combination.<sup>2</sup> In fact, variations were so wide that the coefficient of vulcanization as an index of cure has been generally discarded.

A few observers<sup>3</sup> have mentioned the fact that when certain accelerators are used the vulcanization coefficients of a series of cures plotted against the time of cure fall, not on a straight line, but on a curve concave to the time axis. An especially notable example of this change of direction of the combined sulphur curve, as affected by the metallic xanthates, is shown by Twiss and Thomas.<sup>4</sup> They point out that, when curing at low temperatures with such accelerators in the presence of zinc oxide, the active curing period during which sulphur is combining with the rubber hydrocarbon is extremely short and the rate of reaction decreases rapidly almost to zero as measured by the combined sulphur of the cured rubber. They explain this phenomenon by assuming that the accelerator is involved in two distinct reactions: (1) that in which the sulphur is activated and caused to combine with the rubber, and (2) a decomposition and loss of accelerating potency brought about by the heat.

The second influence is so marked, even at very moderate curing temperatures such as 5 or 10 pounds steam pressure, that relatively large amounts of these accelerators are necessary to produce a full cure before their effect is nullified by thermal decomposition. At higher temperatures the rate of decomposition becomes so rapid that the accelerating effect is almost entirely lost. Whitby and Simmons<sup>5</sup> illustrate what they term "transient catalysis" by sulphur curves obtained with di- $\alpha$ -thionaphthoyl disulphide as accelerator, and observe that it is their experience that all ultra-accelerators in the classes of disubstituted dithiocarbamates or corresponding thiuram sulphides, or salts of the dithiocarboxylic acids and the corresponding dithioacyl disulphides, are active but for a limited time during the cure. While the ultra type affords the most striking example of what have been termed "fugitive" or "transient" accelerators, nearly all organic accelerators exhibit this property to a greater or less extent, and since the number of accelerators now available is rather large and so little has been published in regard to their "persistent" or "transient" qualities during the cure, it was thought that a series of comparisons of these properties of several of the commonly used accelerators

## Some Accelerator Characteristics as Revealed by Coefficients of Vulcanization<sup>1</sup>

A. F. HARDMAN AND FRANK L. WHITE  
Kelly-Springfield Tire Co., Cumberland, Maryland

would be of interest and practical value to the rubber compounder.

The following experimental method will give comparative values. The simple formula—rubber 100, sulphur 5, and zinc oxide 5 parts—was used as the base, to which was added such an amount of each accelerator

as would give fairly equivalent cures and would show a tensile maximum within the curing range selected. Blended smoked sheet was the rubber used. Slabs about  $\frac{1}{8}$  inch (3mm.) thick were cured in the steam heated platen press, usually at intervals of 15 minutes to 2 hours. The physical properties were determined on a Scott testing machine, two or more test pieces being broken from each slab and the best value taken as the tensile strength. The combined sulphurs were determined by difference. Samples were extracted overnight and the free sulphur was oxidized with bromine and determined as barium sulphate in the usual way. By deducting the values obtained from the total sulphur added to the compound, the figures for combined sulphur were obtained.

The method is subject to certain errors, in that no allowance is made for the small amounts of sulphur that may combine with the zinc or materials other than the rubber hydrocarbon, nor for the sulphur which is a constituent part of certain of the accelerators themselves; but since the chief interest in this investigation is the shape of the sulphur curve relative to the time axis, and not the degree of sulphur combination at any particular cure, the method selected is quite accurate enough to give consistent comparative values.

## Results

Twelve different accelerators, most of them well known, were examined in the manner described. The results are graphically represented in Figures 1 to 5, where both the combined sulphur (continuous lines) and the tensile at break (dotted lines) are plotted against the time of cure. In the case of the tensile curves each unit of the scale on the left represents 1,000 pounds per square inch, while the corresponding values in kilograms per square millimeter are shown on the right. All other physical tests, such as elongation at break and load at certain fixed elongation, have been omitted in order to avoid tedious and space consuming tables. It should be mentioned that, when mixing the compounds containing as accelerators the lead and zinc salts of dithiofuroic acid, 0.5 per cent cottonseed oil was added to each batch to promote accelerator dispersions. The accelerator and oil were mixed together to form a paste before being added to the rubber batch. Without such treatment these accelerators have a tendency to stick on the rolls of the mill and form lumps which cannot subsequently be broken up and therefore cause spotting when the mix is cured.

## Discussion

The twelve accelerators examined fall broadly into three classes. One class, represented by hexamethylenetetramine, triphenylguanidine, and "808," consists of persistent accelerators, the sulphur curve for which is a straight line from beginning to end. Another class, represented by lead and zinc dithiofuroate and zinc ethylxanthate, consists of highly transient accelerators, the sulphur curve for which rapidly becomes parallel to the time axis. The accelerators in this class exert their full effect during the first 15 or 30 minutes of vulcanization, and thereafter become inert. Intermediate between these two classes is a class, represented by the remaining

<sup>1</sup> Presented before the Division of Rubber Chemistry at the 73rd meeting of the American Chemical Society, Richmond, Virginia, April 11 to 16, 1927.

<sup>2</sup> Whitby, *Plantation Rubber and Testing of Rubber*, p. 313.

<sup>3</sup> Shepherd and Krall, *Ind. Eng. Chem.*, 14, p. 951 (1922).

<sup>4</sup> Whitby, *Op. cit.*, p. 315.

<sup>5</sup> *J. Soc. Chem. Ind.*, 42, 499T (1923).

<sup>6</sup> *Ind. Eng. Chem.*, 17, 931 (1925).

accelerators, which may be called semipersistent, and which give a sulphur curve concave to the time axis.

The tensile curve for the stock containing hexa (Figure 1) is represented only as far as the 105 minutes' cure, since with this particular mixture the rubber became brittle during the last 15 minutes of cure and its tensile strength fell off almost to zero. Other investigators have reported somewhat similar results with this accelerator, so this tendency to an abrupt overcure may be considered characteristic of hexa and probably of any fairly powerful persistent accelerator. Triphenylguanidine, although also a persistent accelerator, is much slower than hexa, and in consequence no sudden break was reached in the tensile curve during the curing period.

The sulphur curve for the accelerator known commercially as "808" (Figure 3), although not quite a straight line, is sufficiently close to one to justify the classification of the accelerator as persistent. It appears that the stability of this

the sulphur curve being a fairly regular arc; but with the other semipersistent accelerators it is more rapid during the earlier than the later part of the curing period, the sulphur curves showing a deflection in the early part.

The sulphur curve for tetramethylthiurammonosulphide (Figure 4) is less concave than that for the corresponding disulphide. The corresponding zinc dithiocarbamate shows about the same initial rate of cure as the disulphide, but does not fall off at the same rate as the latter.

The lead salt of dithiofuroic acid (Figure 5) is a little slower at the beginning of the cure than the zinc salt. The extreme case of transient acceleration is found in zinc ethylxanthate. The instability of this accelerator is so much greater even than that of the salts of dithiofuroic acid that more than ten times as much xanthate is required as of the latter to produce equivalent cures.

### Conclusion

No attempt has been made to

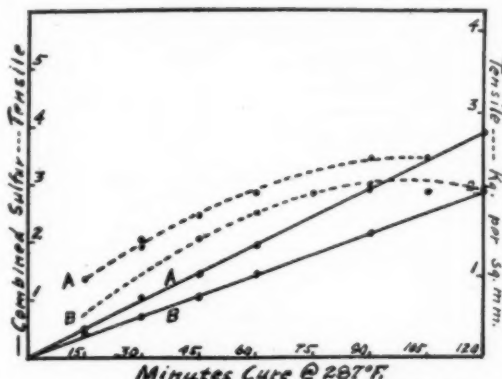


FIGURE 1. A—HEXAMETHYLENETETRAMINE, 0.8 PART; B—TRIPHENYLGUANIDINE, 1.5 PARTS PER 100 RUBBER

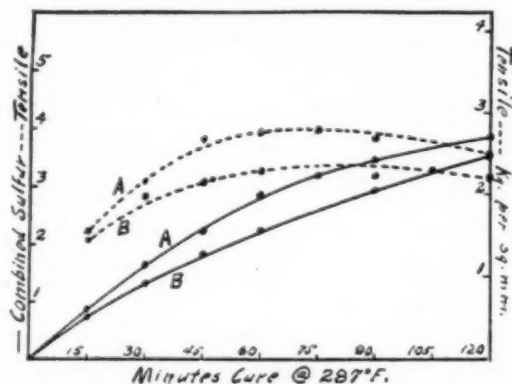


FIGURE 2. A—DIPHENYLGUANIDINE, 0.5 PART; B—ANHYDROACETALDEHYDE ANILINE, 0.5 PART PER 100 RUBBER

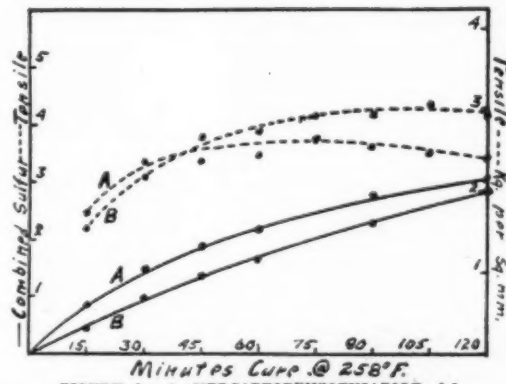


FIGURE 3. A—MERCAPTOBENZOTHAZOLE, 0.5 PART; B—"808," 0.5 PART PER 100 RUBBER

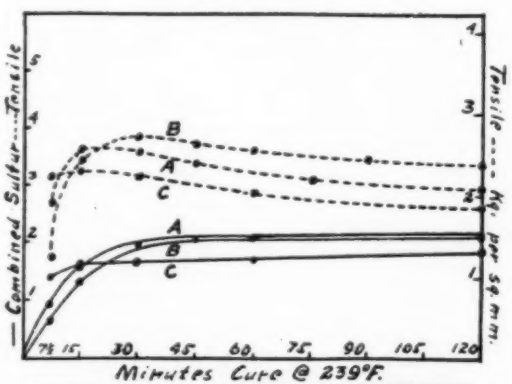


FIGURE 4. A—ZINC DIETHYL DITHIOCARBAMATE, 0.2 PART; B—TETRAMETHYLTHIURAMMONOSULPHIDE, 0.125 PART; C—TETRAMETHYLTHIURAMDISULPHIDE, 0.125 PART PER 100 RUBBER

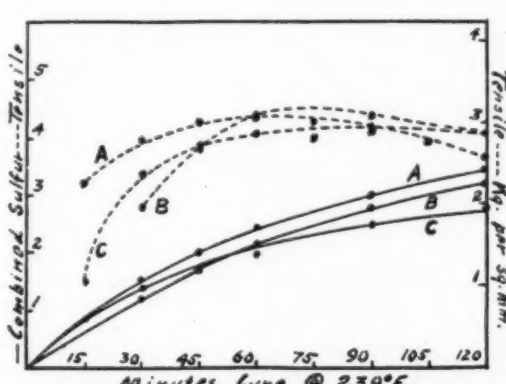


FIGURE 5. A—ZINC DITHIOFUROATE, 0.2 PART; B—LEAD DITHIOFUROATE, 0.3 PART; C—ZINC ETHYLXANTHATE, 2.5 PARTS PER 100 RUBBER

accelerator at 20 pounds steam pressure approaches that of hexa at 40 pounds.

The curing power of the semipersistent accelerators falls off, but does not disappear with increasing period of vulcanization. The falling off with diphenylguanidine (Figure 2) is relatively uniform,

evolve a theory to explain the different behavior of these various accelerators, since each one seems to be a case of its own. But it is evident that both the stability of the accelerator itself towards heat and towards the other vulcanizing agents and the nature of the decomposition products formed are the factors which determine the shape of the sulphur curve. In other words, an accelerator

that is quickly decomposed, whether by heat or by reaction with sulphur, etc., into inert decomposition products will give sulphur curves which are typified by the xanthates or salts of the dithio-carboxylic acids. On the other hand, with an accelerator which is extremely resistant to the disintegrating influences during vulcanization or one in which the various decomposition products continue to exert a curing action equivalent to that of the original substance, there would be produced the persistent, straight-line cure as shown by hexa and triphenylguanidine, and between these two extremes the majority of the now commonly used accelerators may be placed, all of which indicate by their sulphur curves progressive changes in curing effect during the course of vulcanization.

It is believed that a study of these changes as revealed by sulphur coefficients will prove an aid to the compounder in choosing the accelerator best suited to any particular article of rubber manufacture.

## Chemical Patents

### United States

- 1,638,220. **Vulcanization of Rubber.** The process of producing vulcanized rubber which comprises heating a mixture of rubber, sulphur, with the polyaldehyde derivative of an aldehyde amine reaction product.—Winfield Scott, Akron, Ohio, assignor to E. I. du Pont de Nemours & Co., Wilmington, Delaware.
- 1,638,314. **Fluid Fuel.** A method of forming a fluid fuel product which comprises mixing a cracked residual oil with a relatively larger quantity of fuel oil, and a relatively smaller quantity of rubber gum. Next, submitting the mixture to heat and mechanical agitation to obtain thorough blending of the materials.—Edwin J. Barth and Frank Howell, San Antonio, Texas.
- 1,638,421. **Rubber Composition.** A rubber stock having incorporated therein "Therm-tomic" carbon and characterized by having a stiffness much less than that of a rubber composition containing the same amount of common commercial carbon black.—Roy H. Uhlinger, Mount Lebanon Township, Allegheny County, Pennsylvania, assignor to Thermatomic Carbon Co., Pittsburgh, Pennsylvania.
- 1,638,535. **Plastic Material.** A material having the thermoplastic properties of gutta percha comprising a rubber mixed with 8 to 16 per cent sulphur and subjected to a temperature sufficiently high to render the material thus thermoplastic.—Arlene R. Kemp, East Orange, New Jersey, assignor to Western Electric Co., New York, N. Y.
- 1,639,599. **Paint Formula.** A transparent paint composition comprising 3½ parts of finely ground inner tubes and rubber tires mixed with approximately 5 parts of rosin boiled until the ground rubber is dissolved.—Louis Francis, Miami, Florida.
- 1,639,903. **Accelerator.** The process of manufacturing an accelerator for vulcanizing rubber which comprises treating an aldehyde derivative of Schiff's base with an acid, neutralizing the acid and reacting the product so formed with an aldehyde.—Winfield Scott, assignor to The Rubber Service Laboratories Co., both of Akron, Ohio.
- 1,640,363. **Rubber Containing Plastics.** A process for making rubber combinations which comprises causing a reaction to occur between rubber, aldehyde and a condensing agent, and recovering the reaction product formed.—John McGavick, Elmhurst, New York, assignor to The Revere Rubber Co., Chelsea, Massachusetts.
- 1,640,364. **Rubber Containing Plastics.** A process for making rubber combinations which consists in treating vulcanized rubber with a rubber solvent, combining a halogen, a phenol and an aldehyde with the rubber and recovering a combination of rubber, halogen, phenol and aldehyde.—John McGavick, Jackson Heights, New York, assignor to Revere Rubber Co., Chelsea, Massachusetts.
- 1,640,800. **Laminated Rubber.** An article composed of two rubber compounds, one of which as compounded contains a vulcanizing agent and a vulcanizing accelerator, and the other of which, as compounded, is free from vulcanizing agents and contains material which neutralizes the effect of such vulcanizing agents.—Lester C. Peterson, Akron, Ohio.
- 1,640,817. **Reclaiming Rubber.** The process of reclaiming rubber by the addition to the mass to be reclaimed of albuminate of a metal prior to devulcanization and then devulcanizing.—Charles H. Campbell, Pittsburgh, Pennsylvania, assignor to American Glue Co., Boston, Massachusetts.
- 1,640,943. **Footwear.** The method of outsooling a shoe which comprises applying to the sole a layer of composition that includes a rubber emulsion, a filler, and a protective colloid. These are all intimately mixed and coagulation of the emulsion is allowed to take place on the sole causing it to adhere to the bottom of the shoe.—Chauncey C. Loomis, Yonkers, and Henry W. Banks 3d, Noroton, assignors to The Hevea Corp., New York, all in New York.
- 1,641,573. **Treating Latex.** A method for treating latex which consists in retarding vulcanization of the rubber in the latex by inactivating at least one of the vulcanizing ingredients it contains.—Sidney M. Cadwell, Leonia, New Jersey, assignor to The Naugatuck Chemical Co., Naugatuck, Connecticut.

### United Kingdom

- 271,863\* **Preserving Rubber.** Latex is protected against premature coagulation by addition of a water soluble organic derivative of ammonia, such as a mono-, di-, or tri-alkylamine, cyclohexylamine, benzylamine, piperidine and its alkyl derivatives, tri-hydroxyethylamine, etc.—I. G. Farbenindustrie, A. G., Frankfurt-on-Main, Germany.
- 272,269. **Rubber Covered Rolls.** Rollers for use in various textile machines and for off-set printing are covered with rubber composition in which is mixed powdered mica and also, if desired, Kieselguhr, asbestos or other mineral.—L. Minton, Trevelyan Buildings, Corporation street, Manchester.

- 2,241,9. **Catgut Substitutes.** Rubber with or without vulcanizing ingredients with a solution of diresinated gutta percha or balata is used for impregnating cords, etc., as substitutes for catgut.—Dunlop Rubber Co., Ltd., 1 Albany street, Regents' Park, London, A. E. Penfold, R. Truesdale and R. C. Smith, Fort Dunlop, Edgborough, Birmingham.
- 272,860. **Vulcanizing Rubber.** Zinc oxide obtained by the decomposition at a comparatively low temperature of precipitated zinc hydroxide or of a readily decomposable salt such as the acetate, formate, or basic carbonate is used in the vulcanization of rubber.—Chemische Fabrik Kalk Ges. and H. Dehne, 1 Kalker Hauptstrasse, Kalk, Cologne, Germany.
- 273,029. **Rubber Substitute.** Artificial rubber is produced by subjecting animal or vegetable oils to the action of sulphur chloride. The process is carried out in presence of a catalyst consisting of depolymerized chlorine-free artificial rubber.—V. Villa, 13 Rue de Coulmiers, Paris, France.
- 273,031. **Bituminous Emulsions.** Gutta percha pitch, balata pitch or these products in combination are incorporated in bituminous emulsions employed in road making, etc.—Universal Rubber Paviers, Ltd., Chatham Street Rubber Works, Canning street, Audenshaw, near Manchester.
- 273,169. **Rubber-Cellulose Compositions.** Waste rubber containing cellulose is vulcanized and a rubber-cellulose product obtained by plasticizing the rubber in the presence of an alkaline substance such as caustic soda and then submitting the whole to hydrating treatment.—S. A. Ogden, 5238 Sierra Vista avenue, Eagle Rock, Los Angeles, California, U. S. A.
- 273,233. **Spongy Rubber.** Long lengths of sponge rubber are produced by enclosing a suitable composition in a flexible enclosure, such as a fabric tube. The composition may be coated with soapstone if it is desired to remove the fabric, and after being charged may be formed into a coil and vulcanized in a steam chamber.—E. C. R. Marks, 57 Lincoln's Inn Fields, London.
- 273,355. **Molding Ebonite.** Under cured ebonite dust made from 70 parts pale crepe and 30 parts sulphur are placed in a cast iron mold having copper plates for even distribution of heat, and a brass lining to prevent sticking of the article. The mold is put under pressure of 3,000 pounds per square inch and heated to 220 degrees C. for 10 minutes. The mold is cooled in water before the article is removed to prevent porosity.—A. Fraser, 43 Foxley Lane, Purley and Risik, Fraser & Co., Ltd., R. & F. Works, Factory Lane, Croydon, both in Surrey.

\*Not yet accepted.

### Dominion of Canada

- 273,069. **Galvanoplasty.** A method of electro-coating with metal a normally water absorbent body, which is a non-conductor of electricity without bringing the material into physical contact with the electrolyte. The surface of the material is covered with a composition containing colloids in aqueous solution, such as rubber latex. On the dried, water resistant and tacky coating an electroconductive material is applied and a metal is electro-deposited upon it in an electrolyte.—The United Products Corporation of America, Philadelphia, Pennsylvania, assignee of Arthur Biddle, Trenton, New Jersey, both in U. S. A.
- 273,205. **Rubber Thermo-Plastic Derivative.** The method of producing heat-plastic products which comprises causing para-toluene sulfonyl chloride to react with comminuted vulcanized inner tube scrap, etc., under such conditions as to produce a heat-plastic product.—The B. F. Goodrich Co., New York, N. Y., assignee of Harold Gray, Akron, Ohio, both in U. S. A.
- 273,676. **Rubber Compound.** The process which comprises exposing rubber to the action of compressed chlorine in an amount substantially in excess of combining requirements whereby a chlorine fluxed chlorinated rubber is obtained.—The Chadeloid Chemical Co., New York, N. Y., assignee of Carleton Ellis, Montclair, New Jersey, and Norris Roehmer, Chicago, Illinois, all in U. S. A.

### Germany

- 447,631 **Vulcanizing Rubber.**—Chemische Fabrik Kalk, G. m. b. H., Cologne, and D. Hermann Oehme, Köln-Kalk.
- 448,763 **Introducing Various Vulcanizing Ingredients into Comparatively Thin-walled Rubber.**—The Naugatuck Chemical Co., Naugatuck, Connecticut, U. S. A. Represented by Dr. K. Michaelis, Berlin, W. 50.

### Austria

- A5416 **Etching Rubber Plates.**—Société d'Exploitation des Procédés d'Impression Sardon, Marseilles, France.

### France

- 620,228 **Treating Rubber Waste.** F. De Lannoy.
- 621,090 **Compound of Rubber and Metal.** Mue. Veuve Jean Paumen, nec E. Michels.
- 621,115 **Combining Rubber with Metals, Fabrics and Other Materials.** R. M. Withycombe.
- 622,147 **Recovering Volatile Solvents by Adsorption.** Metallbank und Metallurgische Gesellschaft, A. G.
- 622,324 **Recovering Rubber from Beads of Tires.** C. Danier.
- 623,102 **Method of Protecting Rubber Articles Against Aging.** Società Italiana Pirelli.
- 623,563 **Improvements in Accelerators and Their Process of Manufacture.** The Naugatuck Chemical Co.
- 624,754 **Preparing New Products Similar to Rubber.** Consortium für Elektrochemische Industrie G. m. b. H.
- 624,766 **Vulcanizing Rubber.** The Goodyear Tire & Rubber Co.

### DISPERSOL

Dispersol is a compounded softener containing no rosin or rosin oil. It was evolved on the theory that a technically useful softener should consist of a proper lubricant for the rubber particles and a dispersing agent to aid in breaking down the rubber agglomerates and surrounding each nucleus with the lubricant. Dispersol, therefore, contains proved reliable softeners together with an organic dispersing agent. The ingredients are standard materials with well defined specifications and are compounded under scientific control.

# Farrel-Birmingham Amalgamation

**A** MERGER of importance to the rubber manufacturing industry was effected last month between Farrel Foundry & Machine Co., Ansonia, Connecticut, and Buffalo, New York, and Birmingham Iron Foundry, Derby, Connecticut. The new company was incorporated on September 19, as Farrel-Birmingham Co., Inc., with a capital of \$5,700,000.

The Farrel Foundry & Machine Co. was started in a small way in 1848 by Almon

and the large branch plant at Buffalo, New York, is one of the finest in that city. On the Farrel payroll are nearly 1,000 employees. Throughout its long career the concern has preserved its independent corporate entity, two of its directing officers even now bearing the Farrel name. Despite huge expansion, its capital has not been allowed to exceed \$3,000,000.

Operating over ninety years, the Bir-

years by his son, F. D. Wanning, as vice president and general manager.

While the company has manufactured many kinds of heavy metal devices, it is particularly well known for its rubber working machinery in the development of which it pioneered and has acquired worldwide leadership. It is also widely noted for its rolling mill machinery generally, drop presses, iron castings, and chilled rolls, it being one of the first concerns in the country to make the latter. For the Union Army in the Civil War it made machinery for rolling bayonets and gun barrels, and did much foundry and machine work; and in the World War it made hundreds of depth bomb guns and projectiles for fighting submarines, as well as doing much heavy work for arsenals and the emergency fleet.

While building up a most efficient plant and pursuing an aggressive sales policy, company management has always been very conservative, as is evidenced by the fact that only \$90,000 cash has been invested in ninety-one years, the remainder being taken from earnings, and the cash balance now equaling two-thirds of the \$1,200,000 capital stock.

The consolidation of the two companies was approved by the stockholders on September 20, and the following officers and directors were elected:

Charles F. Bliss, president; F. D. Wanning, Walter Perry, Franklin Far-

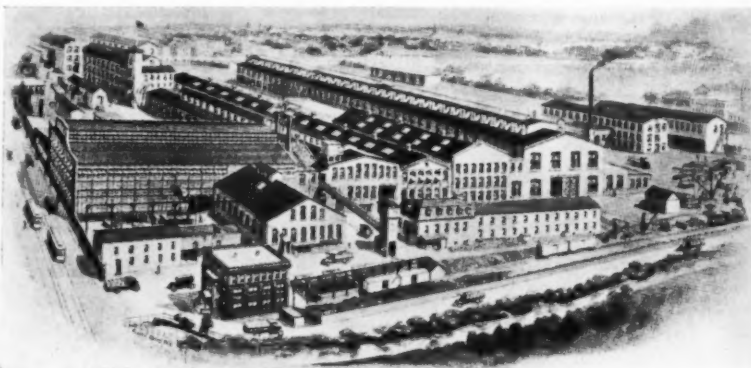
Farrel and his son, Franklin, in Ansonia, Connecticut, the first products being power drives and gears for installations using water power. A mechanic and salesman, young Franklin for a long time did much of his traveling on horseback, and after getting bank advances on orders he bought material and worked hard at the bench. Many of the first machines were delivered with ox teams.

In 1853 the present corporate name was adopted and the operations of the company were extended until they included building rolling mills, calenders, and similar machinery. An early connection was formed with the neighboring rubber industry, some calenders being built for Charles Goodyear in 1854. While chilled iron rolls at first had to be imported from England, before the death of Franklin Farrel his company was exporting such rolls.

Great paper mills next became large users of Farrel machinery, and about 1870 the sugar industry began to make considerable demands upon the Farrel shops for heavy equipment in the West Indies. While still making power drives and gears, the company's output is now largely for rubber, paper, sugar, and metal rolling mills here and abroad. During the World War it manufactured numerous gun carriages and shell presses, besides turbine engine castings for over 100 American torpedo boat destroyers.

The original Farrel plant on the Naugatuck River now covers 13½ acres,

mingham Iron Foundry may be given a patriarchal place among American industries. But, while its management is proud of its age, it esteems even more its up-to-dateness, its substantial position, and especially the fact that since the company



Birmingham Iron Foundry, Derby, Connecticut

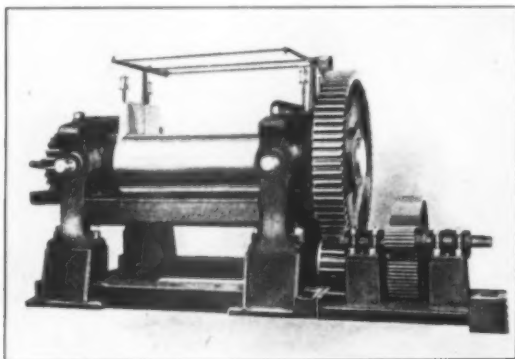
was founded under its present name it has never had a failure nor a compromise with creditors. The foundry was established by three Colburn brothers in Derby, Connecticut, in 1836, and a machine shop was soon added. They sold the plant in 1850 to Sheldon Bassett, who in the same year incorporated it as the Birmingham Iron Foundry. H. F. Wanning, who had been with the concern since 1865, bought control of it in 1891 and has since remained its president, being ably assisted in late

rel, Jr., vice presidents; George C. Bryant, secretary; Carl Hitchcock, W. B. Marvin, assistant secretaries; Alton Farrel, treasurer; F. M. Drew, Jr., and Donald G. Warner, assistant treasurers. Directors: Charles F. Bliss; Franklin Farrel, Jr.; Alton Farrel; George C. Bryant; Walter Perry; David R. Bowen; Franklin R. Hoadley; Nelson W. Pickering; A. G. Kessler; Carl Hitchcock; H. F. Wanning; F. D. Wanning; J. G. Day; W. B. Marvin; F. H. Banbury; W. A. Gordon.

## New Machines and Appliances

### Two-Roll Mixer and Warming Mill

**T**HE customary sizes of two-roll rubber mixing and warming mills are 60 or 80 inch face of the rolls. The following specification particulars apply to the best machine shop practice governing the construction of the mill shown in the following picture.



Nagle Standard Rubber Mill

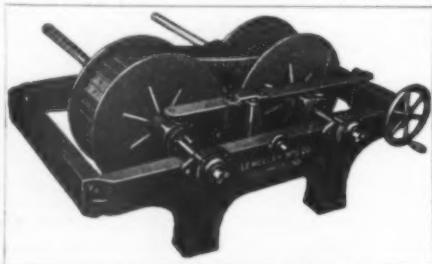
The roll housing caps are of cast steel. The bronze bushings in the roll bearings are conveniently removable for replacement and while they are not literally full bronze bushings, they have all their advantages because the boxes are bored before the bushings are pressed into place. The connecting gears are open hearth steel with cast teeth while the drive gear is semi-steel with cut teeth. The line shaft driving pinion is a cut tooth steel casting made in halves to facilitate its removal when necessary. The rolls are 15 inches in diameter in place of 14 inches as commonly made. A desirable feature is a roll adjustment indicator which consists of a graduated dial on the face of the mill frame located each side for indicating the relative position of the rolls as set by the index pointer attached to the mill screws.

Cast-iron breaking cups are placed between the adjusting screw and the journal boxes to break under loads which would be injurious to the mill and the length is properly designed to prevent disengagement of the connecting gears on the fracture of the cup. —Nagle Machine Co., Erie, Pennsylvania.

### Variable Speed Transmission

There are various places in rubber plants where the installation of a variable speed transmission is desirable, as, for example, in boiler stoker

feeds, the removal of stock from a calender or tubing machine or by conveyor in assembling parts, etc. The machine here represented has special features of design and construction



Lewellen Variable Speed Transmission

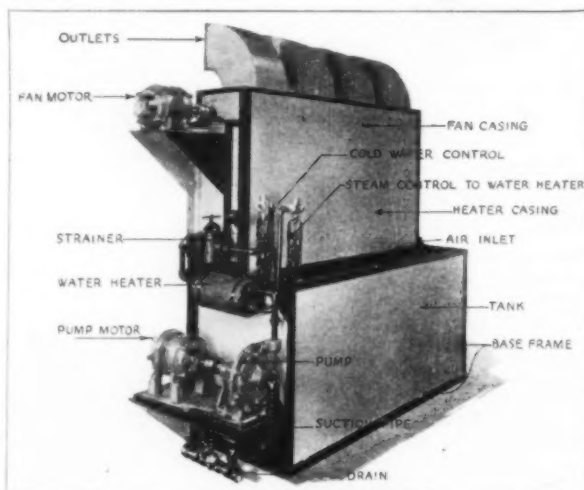
which make it worthy of note. The shafts of the transmission are carried on a special type ball bearing having raceways ground to take the side thrust load as well as the radial load. Bearings are mounted on tapered adapter sleeves and held in place by a spanner

nut locked in position. This insures that the bearing will always be absolutely concentric with the shaft. An improved type of link suspension is used by which side pressure between the bearings and the disk hubs is eliminated. The flexible bearing suspension is self-aligning in every direction. Speeds can be changed under full load with only a slight effort, as the load is suspended on swinging links.

The belt used consists of a high grade rubber body to which are attached leather tipped hardwood blocks spaced at regular intervals. In installing belts it is only necessary to separate the transmission disks, place the belt in position, and make a simple splice. The belt requires very little initial tension.—Lewellen Manufacturing Co., Columbus, Indiana.

### Air Conditioning Unit

A compact and efficient air conditioning unit for factory use is here pictured. This unit is self-contained, requires only to be placed in position, connected to steam, water and electric lines, and the automatic controls set at the desired conditioning point before starting into operation. The principal working parts are indicated in the illustration.



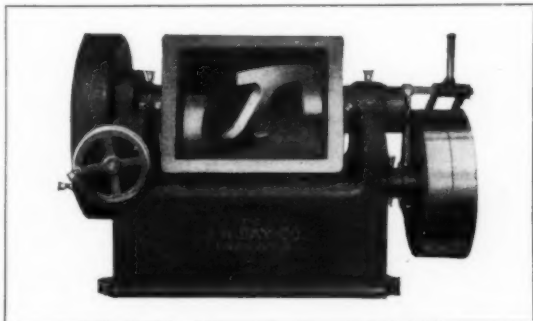
York Air Conditioning Unit

In outline the operation is as follows: Air is drawn into the unit and passed through two successive spray chambers where its moisture content is regulated by the predetermined setting of the controls. After leaving the second spray chamber, the air passes through a series of eliminator plates which remove its excess moisture. Thence the air passes through the heating coil and is raised to the desired temperature and it is then discharged by fans into the room, above the heads of the workers. Once the controls are set, the desired temperature and humidity may be automatically maintained without further attention.

Where dehumidifying is required, a connection is made to a cold water supply. The air, in passing through this chilled water, is automatically forced to give up moisture in excess of the desired percentage, and relatively drier air is blown out by the unit. The temperature of the room is governed by a thermostat, regulating the temperature of the air released. The degree of humidity, whether plus or minus normal, is governed by automatic controls regulating the action of the sprays and the temperature of the water.—York Heating & Ventilating Corp., 1502 Locust street, Philadelphia, Pennsylvania.

### Laboratory Cement Mixer

A rubber cement mixer for experimental use is here illustrated. This machine is mounted on a well designed rigid frame, and has a working capacity of five gallons and total tank capacity of eight gallons. Churning is effected with the same patented type of cast



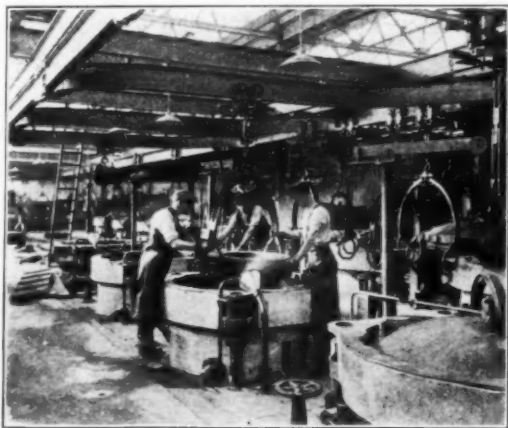
Day Mogul Cement Mixer—Type M.S.A.

steel agitator as the larger production Day mixers, the superior action of which is unexcelled. The mixing tank can be jacketed for heating or cooling and is equipped with a gas tight cover which, with efficient stuffing boxes, prevents loss by evaporation of solvent. The tank is tilted for discharge by means of a small hand wheel on the front of the machine.

Aside from its use in the laboratory for preparation of experimental batches under the same thorough kneading action as in the factory size mixers, this mixer is suitable for production work where small batches of special grades or colors are to be handled. This machine meets with approval wherever installed.—The J. H. Day Co., Cincinnati, Ohio.

### Overhead Runways for Tire Shops

Overhead industrial tracks are indispensable in practically every rubber plant. A most modern and adaptable system of this sort is here pictured as applied in a tire vulcanizing room for loading and unloading pot vulcanizers and transferring the molds about the room as needed in the work.



Morris Overhead Runways in Tire Vulcanizing Room, Dunlop Rubber Co., Fort Dunlop, Birmingham, England

The system of runways pictured offers distinctive advantages of special value. These are high operating speed affording rapid transit for every load because no stopping is required to set switches, there are no open ends in the track and no stops to crash into. The track can be attached to existing supports at points 20 to 25 feet apart without the necessity for bridge work. Since the weight per foot of track is from 6 to 9 times that of any special

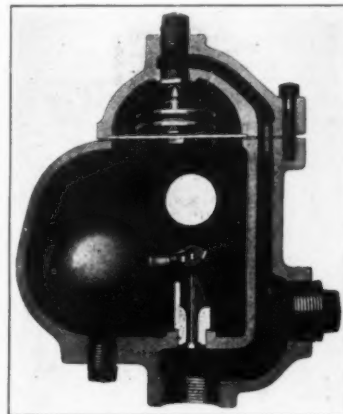
section track and moving parts are entirely absent the runways are as rigid and permanent as the steel structure of a building.

Installations have been in service for 20 years without evidence of wearing out. The runways have actually 12 per cent greater capacity than others because they are built for loads figured in tons of 2,240 pounds instead of 2,000 pounds. Further particulars and specifications will be furnished by the manufacturers.—Herbert Morris, Inc., Buffalo, New York.

### Drip Trap for Vulcanizers

A drip trap such as here represented is considered very essential for draining air from mains and from heating surfaces condensing

large quantities of steam which is usually the case in vulcanizing departments and press rooms of rubber factories. The trap pictured is a heavy duty trap that has met with complete success. It is capable of handling large volumes of condensation and air, yet is compact and sufficiently light so that it may be readily mounted in the pipe line without other support. Its construction includes a float operated valve for the discharge of water and a special thermostatic disk and valve for the discharge



Webster Drip Trap

of air. Inlet openings on both sides are provided so that both right and left hand installations can be accommodated with the same model. Outlet models on both the end and bottom provide for discharge of water, or water or air, either horizontally or vertically to the nearest return line. An opening in the cover provides that air may be discharged separately to a dry return when desired. In the bottom of the trap is a plugged opening which serves as a cleanout. This is a feature that will be appreciated by all trap users.—Warren Webster & Co., Camden, New Jersey.

### Hand Stamp Machine

The illustration represents a small hand machine of rugged construction for use in holding and operating dies or stamps for trade marking small objects and for other marking purposes. The device is also equipped with footpower attachment when it is desirable to have both hands free. Also means can be



"Markwell" Hand Stamp

fitted to feed tape fabrics through the machine from rolls.—Markem Machine Co., 232 Summer street, Boston, Massachusetts and Keene, New Hampshire.

## Machinery Patents

### United States

- 1,638,023. Tire Mold.** One characteristic of this mold is that its parts may be cast to shape instead of machining them. The mold for a solid tire includes bottom ring and top ring mold sections formed with inwardly extending flanges for engagement with a third ring. The latter one forms a bearing for the metal base band of the solid tire. The substitution of casting the mold parts instead of machining them is accomplished by casting the tread ring from aluminum or similar alloy in such way that its surface is practically just as smooth as that produced by machining.—Harry Willshaw, assignor to Dunlop Tire & Rubber Corporation of America, both of Buffalo, New York.
- 1,638,111. Tire Testing Apparatus.** This provides for testing any number or kind of tires under duplicate or predetermined relative conditions so that the results may be comparable under substantially service conditions of temperature, humidity, load, etc. The apparatus is housed and comprises a revolvable annular wear surface which is engaged and driven by the tires under test each individually supported and driven, or braked by a motor acting as a generator. The various tires being under any desired individual loads and free to move to a limited extent in a direction perpendicular to the wear surface so as to approximate service conditions on a vehicle.—Joseph G. Coffin, Hempstead, New York, assignor to Morgan & Wright, Detroit, Michigan.
- 1,638,306. Tire Stripping Machine.** This device is adapted for peeling or stripping the outer tread layers of debanded pneumatic tire casings from their fabric layers. This result is accomplished by first pulling the tread and fabric of the cut tire apart by hand for a short distance. Next the separated ends are inserted between separate pairs of smooth and toothed pulling rolls. A tension lever device is provided to guide the separated tread and fabric in the center of the rolls.—Andrew H. Havir and Henry V. Fletcher, assignors by mesne assignments to Even J. Rollie, all of Minneapolis, Minnesota.
- 1,639,408. Machine for Covering Tubing.** This device is adapted for applying a cover of rubberized fabric to small size tubing. Also it provides for attaching the central portion of rubberized fabric tape to a portion of the tube surface and progressively wrap the fabric about the tube with one edge portion in advance of the other thus making an overlapping seam at the meeting edges of the fabric.—William E. Jaquith, Benjamin A. Evans, and George Forrester, all of Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.
- 1,639,440. Steam Platen.** This comprises a circular ring form platen in which steam circulation passage is drilled radially from the outer margin or edge wall to a suitable depth, and the passages so provided are connected by others disposed diagonally with respect to them. The outer ends of the radial passages are closed by screw plugs and certain of them have pipe connections for steam circulation. The radial and tangential passages form a continuous passage for the circulation of the steam.—Frank H. Smith, Cleveland, Ohio, assignor to Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.
- 1,640,050. Tube Trimming, Wrapping and Rolling Machine.** This is adapted to trim off the uneven end portions of roughly formed rubber tubes while supported upon mandrels and to roll and consolidate the tube in a cloth wrapping preparatory to vulcanization. The tubes on mandrels are fed downwardly into the mechanism by rolling on an inclined plane. The movement of the mandrel and tube upon it into and out of engagement with the cutting knife is regulated by foot-operated mechanism. Afterwards the trimmed tube rolls by gravity into the operative relation with the wrapping rolls.—William Nicholas, assignor to The Black Rock Manufacturing Co., both of Bridgeport, Connecticut.
- 1,640,072. Tire Building Machine.** This machine is specially adapted to place the bead members in pneumatic tires in exactly concentric position with the tire. When the carcass is partially built and is ready for the bead the operator pulls down a lever which charges the front end of a cylinder driving it forward carrying the bead placing mechanism with it. The bead supporting and pressing mechanism is adapted to position itself with regard to the tire core and allows the bead to be accurately placed.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
- 1,640,500. Tire Vulcanizing Apparatus.** This provides an improved type of manifold which permits quick assembly of tire molds in the vulcanizer and connection of the individual tires to the manifold. It also provides for quickly and effectively sealing the connection against leakage of the fluid pressure.—Raymond Hansen, Cudahy, Wisconsin, assignor to The Flak Rubber Co., Chicopee Falls, Massachusetts.
- 1,640,833. Fabric Cutting Machine.** This provides a machine adapted to cut fabric of a tubular character, either of woven or knitted variety, during progress of the fabric through the machine. The fabric is fed twice in tubular or doubled form. A circular knife located within

the fabric between its two layers cooperate along the exterior of the folded edge of the fabric. The fabric is fed in this position between the cutter and the disk so that it is severed longitudinally.—Oscar J. Judelson, Park Ridge, New Jersey.

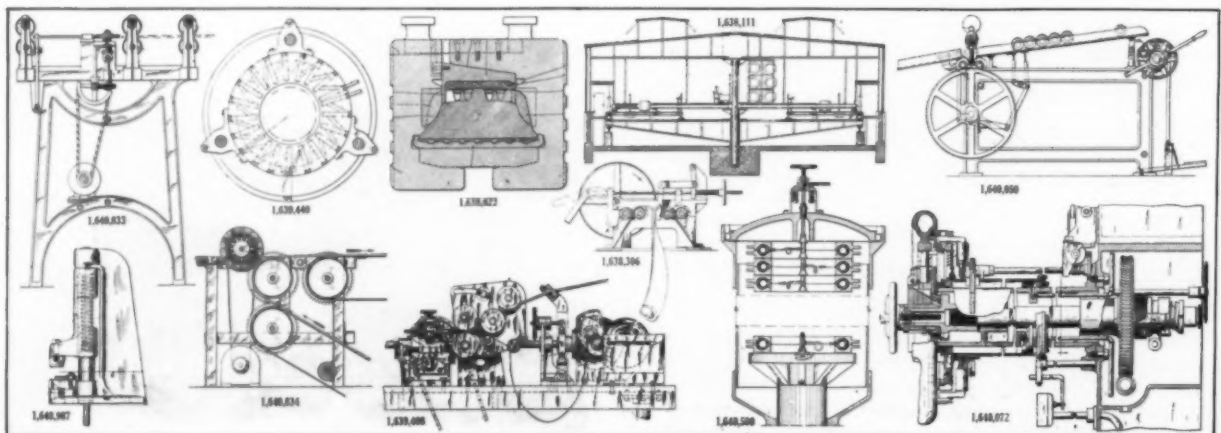
- 1,640,834. Machine for Treating Rubber.** This is designed to remove the surface glaze from unvulcanized rubber as delivered from a tubing machine in order to give it a surface that will adhere to other rubbered surfaces used in construction. The apparatus is essentially a rotary wire brush made to revolve against the surface of a rubber strip traveling over a pulley under the brush. The strip is conducted to and away from the brushing wheel by belt conveyers.—John Kearns, assignor to The Lee Tire & Rubber Co., both of Conshohocken, Pennsylvania.
- 1,640,987. Manufacture of Hollow Rubber Articles.** An equilateral triangular piece of uncured rubber is folded upon itself forming a three-sided enclosure within which is attached a so-called filling pipe or valve for inflating the finished ball. Having sealed the roughly formed blank by hand, within which is enclosed any suitable chemical expanding agent the seams of the blank are effectively sealed along their whole length by a die and press provided for the purpose.—Christian H. Gray, London, England.
- 1,638,049. Inner Tube Testing Case.**—Wilbur E. McAshland, Reeds, Missouri.
- 1,638,224. Rotary Pipe Joint.**—Frank C. Vandergrift, assignor to The Williams Foundry & Machine Co., both of Akron, Ohio.
- 1,638,255. Silent Gear.**—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
- 1,638,997. Tire Spreader.**—Arthur C. Hopkins, assignor to National Standard Co., both of Niles, Michigan.
- 1,639,312. Tool for Placing Heel Washers.**—Charles I. Schrock, Pasadena, California, assignor to the Goodyear Tire & Rubber Co., Akron, Ohio.
- 1,639,430. Making Hollow Rubber Articles.**—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
- 1,639,566. Tire Spreading Device.**—Hugh T. Hughes, Cleveland, assignor to The Wadsworth Core Machine & Equipment Co., Akron, both in Ohio.
- 1,639,613. Digester.**—Carlton Riddle, assignor to The McNeil Boiler Co., both of Akron, Ohio.
- 1,639,895. Precision Adjustment Device.**—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N. Y.
- 1,640,077. Apparatus for Finishing Tubes.**—Horace Hillyard Hastings, Quebec, Canada.
- 1,640,281. Repair Vulcanizer.**—Charles C. Marble, Bradenton, Florida.
- 1,640,376. Tube Repairing Clamp.**—Roy Santmyer, New York, N. Y.
- 1,640,491. Calendar.**—Bertram Joseph Dykes, Glendale, near Sheffield, England.
- 1,641,083. Tire Tool.**—Frank D. Hite, Minneapolis, Minnesota.
- 1,641,490. Retread Mold.**—John E. Howell and George E. Sapp, both of Sacramento, California.
- 1,641,499. Retread Mold.**—Floyd M. Milford, Burkburnett, Texas.

### Reissue

- 16,702. Blitting Means.** Robert McC. Johnstone, Roselle Park, New Jersey, assignor to Cameron Machine Co., Brooklyn, New York. Filed June 16, 1927. Serial No. 199,387. Original No. 1,597,800, dated August 31, 1926. Serial No. 636,134, filed May 2, 1923.

### Dominion of Canada

- 572,996. Vulcanizer.**—The Akron Standard Mold Co., assignee of Wade S. Galvin, both of Akron, Ohio, U. S. A.
- 573,029. Inner Tube Vulcanizer.**—The Kublie Machine Co., assignee of Otto J. Kublie, both of Akron, Ohio, U. S. A.
- 573,202. Tire Machine.**—The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Adrian Oren Abbott, Jr., Detroit, Michigan, U. S. A.
- 573,279. Vulcanizing Process.**—Laurits A. Laursen, Akron, Ohio, U. S. A.
- 573,280. Vulcanizing Process.**—Laurits A. Laursen, Akron, Ohio, U. S. A.
- 573,500. Vacuum Tire Shaping Machine.**—The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Adrian Oren Abbott, Jr., Detroit, Michigan, U. S. A.
- 573,504. Cementing Device.**—The Goodyear Tire & Rubber Co., assignee of Robert W. Snyder, both of Akron, Ohio, U. S. A.
- 573,505. Hose Wrapping Device.**—The Goodyear Tire & Rubber Co., assignee of Jorgen I. Haase, both of Akron, Ohio, U. S. A.
- 573,506. Tire Trimmer.**—The Goodyear Tire & Rubber Co., assignee of Edwin G. Templeton, both of Akron, Ohio, U. S. A.



- 273,507 Torque Neutralizing Mechanism.—The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of Ellis W. Templin, Philadelphia, Pennsylvania, both in U. S. A.
- 273,508 Tire Mold.—The Goodyear Tire & Rubber Co., assignee of Max C. Nelson, both of Akron, Ohio, U. S. A.
- 273,509 Mold.—The Goodyear Tire & Rubber Co., assignee of Leon S. Washburn, both of Akron, Ohio, U. S. A.
- 273,510 Heel Mold.—The Goodyear Tire & Rubber Co., assignee of Jorgen I. Haase, both of Akron, Ohio, U. S. A.

### United Kingdom

- 271,957 Tire Vulcanizer.—A. Matthews, 36 Mighell street, Brighton, Sussex.
- 272,252\* Tire Vulcanizer.—The B. F. Goodrich Co., 1780 Broadway, New York, N. Y., assignees of J. R. Gammeter, 680 North Portage Path, Akron, Ohio, both in U. S. A.
- 272,346 Holder for Painting Golf Balls.—P. H. Tucker, 20 Fawnbrake avenue, Herne Hill, London.
- 272,572 Grinder.—C. E. Gardner, W. Gardner & Sons (Gloucester), Ltd., Bristol Road, Gloucester.
- 272,608 Latex Coagulating Tank.—Sarco Engineering & Trading Co., Ltd., Old Colony Club, Adlywch House, London. (W. Kellitt, Seremban, Negri, Sembilan, Malay States.)
- 272,674\* Cutter.—Miller Rubber Co., assignee of J. W. Brundage, both of Akron, Ohio, U. S. A.
- 272,992 Tire Vulcanizer.—Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, H. Willshaw and T. Norcross, Fort Dunlop, Erdington, Birmingham.
- 273,018 Tire Mold.—Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and J. A. Cannan, Fort Dunlop, Erdington, Birmingham.
- 273,236\* Dental Flask.—Ohio Chemical & Manufacturing Co., 1177 Marquette street, assignee of M. L. Axelrod, 11310 Gray avenue, both of Cleveland, Ohio, U. S. A.
- 273,246\* Tire Mold.—Vulcan Rubber Proprietary, Ltd., Macaulay Road, Kensington, Victoria, Australia.
- 273,455 Enclosed Mixer.—R. C. Lewis and Farrel Foundry & Machine Co., 25 Main street, Ansonia, Connecticut, U. S. A.
- 273,483 Tire Mold.—A. Lagruta, 18 Livingstone street, Ivanhoe, Victoria, Australia.
- 273,607 Repair Vulcanizer.—O. C. Dennis, 3800 Ravenswood avenue, Chicago, Illinois, U. S. A.
- 273,645 Dental Vulcanizer.—Ohio Chemical & Manufacturing Co., 1177 Marquette street, assignees of M. L. Axelrod, 11310 Gray avenue, both of Cleveland, Ohio, U. S. A.

\* Not yet accepted.

### New Zealand

- 57,994 Tire Mold.—James Francis and William Thomas Barnes, both of 180 Camberwell Road, Upper Hawthorn, and Michael David Kennedy, 21 Rotherwood street, Richmond, all of Bourke, Victoria, Australia.

### France

- 619,340 Apparatus and Processes for Treating Rubber. The Dunlop Rubber Co., Ltd.
- 619,390 Molding Bag for Vulcanizing Tires. Societe des Procedes Fit.
- 620,346 Device and Process for Reclaiming Rubber and Fabric Articles. J. Thiberville.
- 620,601 Apparatus and Process for Vulcanizing Tubes. L. A. Laursen.
- 620,692 Apparatus and Process for Vulcanizing Rubber Articles. L. A. Laursen.
- 620,679 Machinery for Dipping and Varnishing Rubber Articles. A. Boecler.
- 620,680 Machine for Dipping with Solvent Recovery. A. Boecler.
- 620,995 Tire Tread Vulcanizer. Societe des Procedes Fit.
- 621,323 Apparatus for Vulcanizing Rubber. T. Durst.
- 621,634 Machine for Removing the Linings from Rubberized Fabrics, Tires, etc. E. A. A. G. Caillaud.
- 621,924 Tire Tread Vulcanizer. C. M. Gautier.
- 622,846 Apparatus for Repairing Tire Casings. P. Rougeri and J. Brousse.
- 622,975 Device for Continuous Vulcanization of Tires, etc. Societa Italiana Pirelli.
- 623,362 Heating Apparatus for Use in Vulcanizing Rubber. De Becker et Laggard.
- 623,862 Mold for Retreading. Societe Petitgars et Falgulere.
- 624,190 Apparatus and Process for Reclaiming Vulcanized Rubber. Societa Italiana Pirelli.

### Germany

- 448,241 Device for Attaching Rubber Tread Patches to Heels.—Gustave H. Schmidt, Martinstrasse 4, Berlin-Steglitz.
- 448,551 Apparatus for Pressing Thin Sheets from Plastic Masses.—Horst Ahnholdt, Constantinople. Represented by Dr. F. Berg, Mannheim.

### Designs

### Germany

- 998,426 Dipping Apparatus.—Nienburger Maschinenfabrik A. G., Nienburg a. d. S.
- 998,711—Spreading Machine.—Nienburger Maschinenfabrik A. G., Nienburg a. d. S.
- 998,712 Spreading Machine.—Nienburger Maschinenfabrik A. G., Nienburg a. d. S.

## Process Patents

### United States

- 1,636,659 Tire Tubes.—Walter L. Fairchild, New York, N. Y.
- 1,638,810 Cushion Tire.—Fred R. Klaus, assignor to The American Welding & Manufacturing Co., both of Warren, Ohio.
- 1,639,818 Submarine Hulls.—Harry N. Atwood, Monson, assignor to Rubberwood, Inc., Lawrence, both in Massachusetts.
- 1,639,861 Tube Lining.—John Schwab, Jr., Winnipeg, Manitoba, Canada.
- 1,640,021 Packaging Toric Articles.—Edward H. Angier, Framingham, Massachusetts.
- 1,640,022 Packaging Toric Articles.—Edward H. Angier, Framingham, Massachusetts.
- 1,641,128 Rubber Shoes.—Ernest W. Dunbar, Hudson and Herman Westling, Boston, assignors to Cambridge Rubber Co., Cambridge, all in Massachusetts.
- 1,641,598 Reclaiming Rubber.—George J. Miller, Douglas, Arizona.
- 1,641,639 Repairing Overshoe Heel.—Christian Petersen, Sioux City, Iowa.

### Dominion of Canada

- 273,407 Tire Tube and Flap.—Clark Francis Flak, Camden, New Jersey, U. S. A.
- 273,610 Rubber Tire.—Anthony Lagruta, Ivanhoe, Victoria, Australia.
- 273,713 Elastic Woven Fabric.—La Société du Caoutchouc Manufacture, assignee of Alfred Laurin, both of Paris, France.

### United Kingdom

- 271,870\* Valve.—A. G. Spaulding & Brothers (British), Ltd., 317 High Holborn, London, assignees of M. B. Beach, Springfield, and W. W. MacDonald, Chicopee, both in Massachusetts, U. S. A.
- 272,187\* India Rubber Compositions.—Rubber Latex Research Corp., 185 Devonshire street, assignee of W. B. Westcott, 80 Federal street., both in Boston, Massachusetts, U. S. A.
- 273,155 Nipples.—W. C. Ingram and E. J. Everest, London India Rubber Works, Felstead street, Hackney Wick, London.

\* Not yet accepted.

### New Zealand

- 57,735 Catgut Substitute.—The Dunlop Rubber Co., Ltd., of Dunlop House, 1 Albany street, Regent's Park, London, N. W. 1, Albert Ernest Penfold, Reginald Truesdale and Robert Charles Smith, all of Fort Dunlop, Erdington, Birmingham, Warwick, all in England.

### Germany

- 447,730 Producing Artificial Flowers from Sheet Rubber.—Doris Sophie Munn, Scotland. Represented by A. Elliot, Berlin S. W. 48.
- 447,862 Producing Rubber Tubes.—Revere Rubber Co., New York. Represented by R. H. Korn, Berlin S. W. 11.

### France

- 621,961 Manufacturing Semi-Pneumatic Tires for Vehicles. Pirelli & Co.
- 624,819 Vulcanizing Rubber. The Goodyear Tire & Rubber Co.

## Across-the-Line Starter

The Across-the-Line starter pictured with cover swung to one side is no larger than a telephone box yet handles motors of 5-horse power or less, giving push button control of starting and stopping. It also provides protection for both thermal overload and no-voltage. The starter is provided with push buttons in the front cover of the case. Its small size permits mounting the starter where the control station would ordinarily be placed and the extra wiring and cost of a push button station is thus saved. One or more push button stations may be used if desired.

A novel feature is the type of contactor used in this starter. A roller is forced between two fingers to complete the circuit. Thus a double break, and a wiping contact are secured which reduces arcing to a negligible minimum.—The Cutler-Hammer Manufacturing Co., 323 North Michigan avenue, Chicago, Illinois.



C.-H. Across-the-Line Starter—Door Open

## New Goods and Specialties

### New Utility Tire

The United States Rubber Co., 1790 Broadway, New York, N. Y., announces



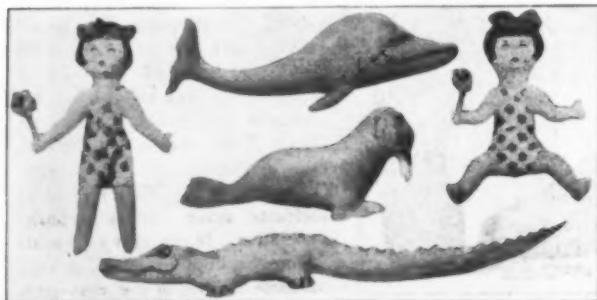
USCO Junior

a new USCO junior tire which will be welcomed by the owners of utility cars throughout the country. The tire will stand hard and constant wear and is made in two sizes: 30 by 3½ for high pressure, and 29 by 4.40 for balloon.

### Inflatable Rubber Novelties

Realistic animals, painted in natural colors, cause considerable amusement in swimming pools and on the beach when inflated to their formidable length of five and six feet. The illustration shows an alligator, whale and walrus which are equipped with water pockets to keep them in upright positions. The pockets are first filled with water, after which the animal is inflated and set in the pool to the consternation of the majority of bathers.

The dolls shown are a product of the same manufacturer, Dr. Dorogi & Co.,



Realistic Toys for the Beach and Pool

Gummifabrik A.-G., Budapest - Albertfalva, which makes a complete line of these inflatable goods. Represented in America by The Bing Corp., 33-37 East 17th street, New York, N. Y.

### Card Table Cover

For bridge players who like to smoke while they play, the Seiberling Rubber Co., Akron, Ohio, has produced a new card table cover called Kemi-Suede which is water and ink proof.

### Chemically Heated Bag

A hot bag for foot-warming, etc., that can not leak and that is heated by



dampening a sack of chemicals placed within it is the Volcano Instant Hot Bag. It is claimed to be entirely safe and can yield a constant heat for 125 hours without recharging. Made by the Eno Rubber Corporation, Torrance, California, for the California Chemical Co., 59-61 South Hoover street, Los Angeles, California.

ILLUSTRATING  
MODELS OF THE  
WHALE,  
WALRUS,  
ALLIGATOR  
AND DOLL,  
INFLATED.  
AND READY FOR  
THE DAILY  
SUN BATH  
AND DIP



"Rubber Baby"

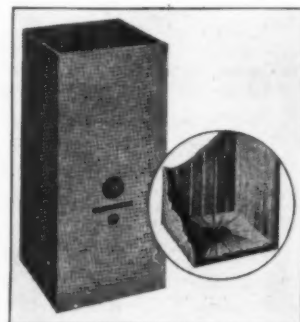
### Speed Boat

The first rubber speed boat, Rubber Baby, was primarily built as an all-around family craft, but it has proved so fast that several racing events have been won by its owner, A. G. Maranville of the aeronautic sales department of The B. F. Goodrich Co., Akron, Ohio.

In appearance the boat does not differ from the ordinary speedster. Its hull is made of aeroboard, the outside covered with a thin soft rubber skin which seals all joints and provides a wear resisting surface. The fact that rubber does not absorb moisture prevents the hull from becoming water logged and enables the boat to retain its original lightness and speed. No boat house is necessary, as the craft need never be removed from the water.

### Rubber Cover for Explosives

This can cover of rubber has been designed to reduce to a minimum the risk in the handling and transporting of nitroglycerine. It is made of a special rubber

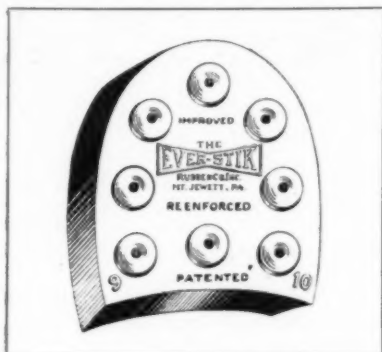


Nitro-Glycerine Can Cover

compound and in its construction care and thought have been given to the conditions and use to which it will be subjected. Endorsement of the cover has been unanimous by men long accustomed to explosives and their dangers.—United States Rubber Co., 1790 Broadway, New York, N. Y.

### Improved Rubber Heel

The Ever-Stik rubber heels are made of high grade materials reinforced and applied by special nails. The reinforcement is of great value and is especially appreciated as a means of giving stiffness, which when applied forms a tight joint about its entire periphery. The special nail used to apply the heel does away with washers and is designed to prevent the

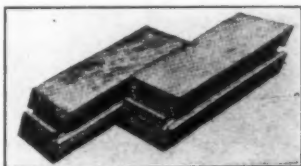


Ever-Stik Heel

securing nails from being pulled through the heel.—The Ever-Stik Rubber Co., Inc., Mt. Jewett, Pennsylvania.

### Interlocking System for Paving Blocks

The increasing popularity of the rubber roadway has produced many new types of blocks, one of the most interesting of which is the Grip Interlock, designed to

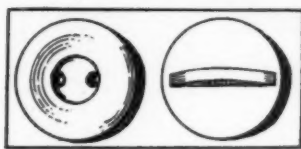


Method of Interlocking

prevent any lateral or horizontal creeping apart. The blocks are of solid formation and the system of interlocking forms a perfect union between each block without employing any other means of adherence.

### Wringer-Proof Button

The new Wringer-Proof rubber button is no heavier than an ordinary pearl button, the necessary thickness being obtained by a rounded ridge formed between the sewing holes. This ridge raises the buttons above the surface of the garment so that they are easily buttoned and causes them to pass smoothly through the wringer rolls. They are not affected by boiling or ironing, do not cut the threads nor tear out the fabric and will not injure the rolls. An excellent white color has been obtained, and the patented construction, it is claimed, makes the button last as long

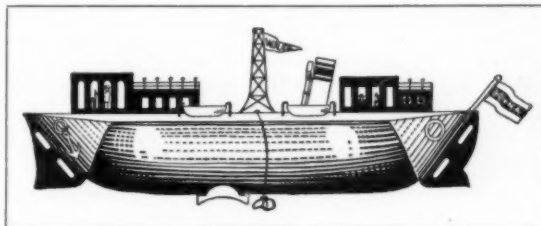


Rubber Button

as the garment.—The Wringer-Proof Button Co., 320 South Franklin street, Chicago, Illinois.

### Armorduct Guttaflex

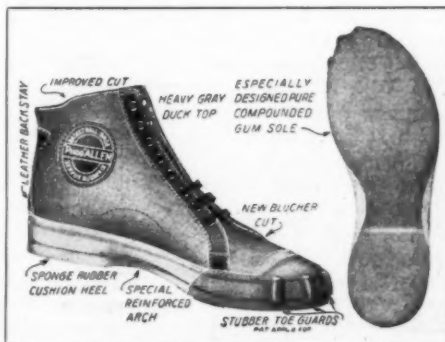
Perfect protection from breakage and safety from shock is claimed by the manufacturer, Armorduct Cable Co., for a new non-kinking, damp proof flexible cord. It is armored with a close mesh of rubbered cotton strands designed to allow the right degree of flexibility and perfect freedom in the use of the apparatus which it feeds. The conductors are of tinned copper, covered with double vulcanized insulation and with ordinary rubber. The rubber cords are colored red and blue.



Playtime Steamboat

### Shoe for Basketball

The Phog Allen basketball shoe, designed by one of the premier coaches of America, is light in weight yet sturdy and wear resisting. The extremely fast sole will not slip on the smoothest floor, nor burn, nor scruff off. Special built-in reinforcement in shank supports the arch at its weakest point, and the stubber toe guards protect the toes and add materially to wear at this vulnerable point. The sponge rubber heel cushion eliminates shock, and tight lacing will not cut, pinch nor bind because of the design of the top of the shoe. The manufacturer is The Servus Rubber Co., Rock Island, Illinois.



Allen Shoe

### Nozzle for Flask or Bottle

A recent design, patented by E. P. Ponti, Turin, for a rubber nozzle is made to fit over the neck of a bottle or flask with an air inlet so proportioned as to admit the right amount of air required to displace the discharged liquid when the bottle is inverted.

### Sunshine Toy Balloons

A very complete assortment of toy balloons is manufactured by The Wooster Rubber Co., Wooster, Ohio, all of which are listed under the brand, Sunshine toy balloons.

A great number for parks and seaside is the playtime steamboat, 30 inches long, with balloon body and lithographed parts in four bright colors to make up the deck and other sections. The boat rides the water on river, lake or sea.

Another number, particularly appropriate for this season of the year, is Jumbo, the turkey gobbler. When assembled it stands ten inches high and is formed from a balloon body with head, wings and tail of bright lithographed parts. It makes



Turkey Gobbler

an attractive toy for banquets, parties and dances, and looks good enough to eat.

### Electric Cord

A new type of electric cord has the wires woven into a loose braid separated by an elastic non-conductor which makes contact when pressure is applied. If the cable is squeezed at a contact, the circuit is completed and the signaling or operating cord is actuated. It is the invention of a Hungarian engineer, Oscar Nagy, and is believed to be practical for use with complicated machinery when threatened accidents make sudden stoppage imperative. It can also be operated by the knee or elbow, a convenience lacking in the usual type of switches and push buttons.

## New Trade Publications

**The Barco Lubricated Plug Valve** is an eight page catalog introducing a new type of steam jacketed lubricated plug valve for hot tar, asphalt, and similar services, together with a special air hoist valve with a  $\frac{1}{4}$  inch diamond port opening for operating air hoists. These valves are products of the Barco Manufacturing Co., 1801 Winnemac avenue, Chicago, Illinois.

**Commerce Yearbook, 1926**, Volume 1, has been compiled by the Bureau of Foreign & Domestic Commerce, Julius Klein, director. The yearbook this year is being issued in two volumes. Volume 1 contains detailed information concerning business conditions in the United States, and will be followed by a second volume to contain similar data, in less detail, of about 70 foreign countries and noncontiguous territories of the United States.

**"A. S. T. M. Year Book—1927."** This annual year book of the American Society for Testing Materials comprises 400 pages in which are listed the officers and members of the Executive Committee, general information, members, committee personnel, regulations, standards, tentative standards, and tentative revisions of existing standards together with other official information of importance to members.

## Abstracts of Recent Articles

**THE MOLDING AND VULCANIZATION OF RUBBER ARTICLES.** Discussion of molds and vulcanizers, their operation; need for pressure; time and temperature control; the use of accelerators; mold handling and conveying; bakelite and ceramic molding.—H. Willshaw. *Chem. & Indus.*, Aug. 26 and Sept. 2, 1927, pp. 760-64 and 783-85. Illustrations.

**NOTES ON THE ECONOMICAL PRODUCTION OF SEAMLESS TEATS.** Description of manufacturing methods.—Anonymous. *I. R. Jour.*, Sept. 3, 1927, pp. 367-74. Illustrated. From *Gum. Zeit.* 41, No. 2, 79.

**SOME ASPECTS OF MODERN RUBBER PLANTING.**—G. F. S. Sutton (Poerwodjo Estate, East Java). *I. R. Jour.*, Sept. 3, 1927, pp. 81-84.

**THE ELECTRO-DEPOSITION OF RUBBER AND THE ANODE PROCESS.**—H. P. Stevens. *Bull. R. G. Asso.*, Aug., 1927, pp. 514-16.

**DUST MOLDINGS.** Methods of manufacture.—Anonymous. *Rubber Age*, (London) Aug., 1927, pp. 235-8, Sept., 1927, pp. 280-90. Illustrated.

**RUBBER AS A CONSTRUCTIONAL MATERIAL IN CHEMICAL ENGINEERING.**—B. D. Porritt. *Rubber Age*, (London), Aug., 1927, pp. 256-7. Serial.

**POLYMERIZATION AND RUBBER.**—J. R. Katz with J. Selmann and L. Heyne. *Kauts.*, 1927, pp. 215-22.

**VULCANIZATION OF CONCENTRATED LATEX.**—P. Schidrowitz. *Kauts.*, 1927, pp. 202-203.

**ULTRAMICROSCOPIC STUDIES ON THEORY OF VULCANIZATION** by H. Dannenberg. New Effect of Light in the System Rubber-Sulphur by H. Pohle.—F. Kirchhof. *Kauts.*, 1927, p. 184.

**ON THE FASTNESS OF COLOR OF INORGANIC AND ORGANIC RUBBER COLORS TOWARD ORGANIC VULCANIZATION ACCELERATORS.**—Dr. Rudolf Ditmar. *Chem. Zeit.*, No. 35, (1927).

**A NEW LIGHT COLORED FACTICE STABLE TO ACCELERATORS FOR HOT AND COLD VULCANIZATION.**—Rudolph Ditmar. *Chem. Zeit.*, No. 62, p. 599, (1927.)

**RAW RUBBER.**—A description of different sources and types of rubber.—J. Dugué. *Rev. Gén. Caout.*, 1927, No. 30, pp. 21-4.

**SYNTHETIC RUBBERS.** III Composition of Synthetic Rubbers.—L. Stoim. *Rev. Gén. Caout.*, 1927, No. 30, pp. 3-5. IV Comparison of the Properties of Natural Rubber with Those of Synthetic Rubber. *Rev. Gén. Caout.*, 1927, No. 30, pp. 5-6.

**EARLY REFERENCES TO RACKED RUBBER.**—T. R. Dawson. *I. R. Jour.*, 74, p. 18, (1927.)

**FORMULAS OF MIXTURES.** Summary of patents pertaining to the reclaiming of rubber.—Rudolph Ditmar. *Le Caoutchouc*, 24, 13, pp. 556-8, (1927.)

**DETERMINATION OF MOISTURE IN RAW RUBBER.**—D. Armstrong and T. J. Drakeley. *Analyst*, 52, pp. 338-9, (1927.)

**THE APPLICATIONS OF THE CHEMICAL WASHING PROCESS TO THE RUBBER INDUSTRY.** Comments on the recovery of solvents.—George Weissenberger. *Kauts.*, 1927, pp. 187-8.

**THE PHENOMENA OF ANTIOXIDATION.** Application to Problems Relating to the Treatment and Preservation of Rubber. A critical review and discussion of the general phenomena of anti-oxidation.—Charles Moureu and Charles Dufraisse. *Rev. Gén. Caoutchouc*, No. 32, pp. 3-9, (1927.)

**DRY RUBBER CONTENT OF HEVEA LATEX FROM TREES IN CLEAN WEEDED AREAS AND IN AREAS UNDER FERN GROWTH.**—Records indicate that the dry rubber content of latex from trees of similar age growing in clean weeded areas and in a cover of ferns is similar.—F. G. Spring. *Malayan Agr. J.*, 15, pp. 78-81, (1927.)

**THEORY OF THE VULCANIZATION OF RUBBER.**—A. Maximoff. *Le Caoutchouc*, 24, pp. 13,582-4, (1927.)

**CONTROL OF RUBBER VULCANIZATION IN AIR.**—M. Pavlenko and V. Myagkov. *J. Chem. Ind. (Russia)*, 3, pp. 1203-6, pp. 1288-91, (1926.)

**NOTES ON SPREADING DOUGHS AND ADHESIVE SOLUTIONS.**—Werner Esch. *I. R. Jour.*, Aug. 20, 1927, pp. 293-4.

**RUBBER PROOFING FOR THE GARMENT TRADE.**—J. Lloyd. *I. R. Jour.*, Aug. 27, 1927, pp. 329-33. Illustrated.

**INVESTIGATION ON THE OCCURRENCE OF FISSURES IN THE INTERIOR OF HEVEA BARK.**—Dr. W. Bobiloff. *Archief voor de Rubbercultuur*, July, 1927, pp. 251-260. Illustrations; English summary, 261.

**MOULD ON RUBBER.**—Dr. O. De Vries. *Archief voor de Rubbercultuur*, July, 1927, pp. 262-278. Tables; English version, pp. 278-283.

**DETERMINATION OF NITROGEN IN LATEX FROM HEVEA BRASILIENSIS BY THE TER MEULEN METHOD.**—Ir. L. R. van Dillen. *Archief voor de Rubbercultuur*, July, 1927, pp. 284-286. Tables; English version, pp. 287-288.

**RECENT X-RAY INVESTIGATIONS OF RUBBER AND RELATED SUBSTANCES.**—Dr. E. A. Hauser (after experiments carried out together with M. Hunemörder and Dr. P. Rosbaud). *Kaut.*, July, 1927, pp. 228-230. Illustrations.

**CONTRIBUTIONS TO THE STRUCTURE OF GUTTA PERCHA AND BALATA.**—Dr. Hermann Miedel. *Kaut.*, July, 1927, pp. 230-232.

**ON THE CONSTITUTION OF RUBBER.**—Dr. Rudolf Pummerer. *Kaut.*, July, 1927, pp. 233-236.

**ON THE CONSTITUTION OF HIGHLY POLYMEROUS COMBINATIONS, PARTICULARLY RUBBER.**—H. Staudinger (Remarks called forth by the paper on the Constitution of Rubber by Pummerer). *Kaut.*, July, 1927, pp. 237-238.

**THE OXIDATION OF RUBBER FROM THE SCIENTIFIC AND TECHNICAL POINT OF VIEW I.**—Dr. F. Kirchhof. *Kaut.*, July, 1927, pp. 239-245. Graphs, tables, illustrations. Part II, Aug., 1927, pp. 256-261.

**RUBBER AS DIELECTRIC MATERIAL.**—Dr. St. Reiner. *Kaut.*, Aug., 1927, pp. 261-263. Bibliography.

**THE EFFECT ON YIELD OF MANURING RUBBER WITH NITRATE OF SODA.**—R. H. Stoughton-Harris. *The Tropical Agriculturist*, July, 1927, pp. 20-22. Tables.

**THE AGING OF RUBBER—ITS KEEPING QUALITIES.**—F. Jacobs. *Le Caout & la Gutta-percha*, Aug. 15, 1927, pp. 13,654-656.

**ON OBTAINING THE BEST MIXINGS FOR AUTOMOBILE TIRES.**—Dr. Werner Esch. *Gum.-Zeit.*, July 22, 1927, pp. 2,423-2,424. Formulas.

**DECLARED EXPORTS OF RUBBER TO THE UNITED STATES FROM MANAOS, BRAZIL,** totaled during the first quarter of 1927, according to consular reports, 6,189,000 pounds, against 5,274,000 pounds in the corresponding quarter of 1926. Balata exports to the United States increased to 301,000 pounds from 42,000 pounds.

## Editor's Book Table

**"Latex-Sein Vorkommen, seine Gewinnung, Eigenschaften, sowie technische Verwendung."** Dr. Ernst A. Hauser. Appendix—Patent Review, compiled by Dr. Carl Boehm von Boernegg. Published by Theodor Steinkopff, Dresden and Leipzig, 1927. Paper, 243 pages, 6¼ by 9¼ inches, with 74 illustrations.

Although various authorities have treated with more or less fullness the subject of latex in works pertaining to rubber, it remained for the well known scientist, Dr. Hauser, to fill the need for a book dealing exclusively with latex. In the present work the author first reviews briefly the older data on the subject, then devotes a chapter to the most important rubber, gutta percha and balata plants, giving a list of the plants, their habitat, and the type of product, arranged under the families to which the different species belong. A full bibliography on the physiological significance of the latices is also appended to the chapter. The various tapping methods employed is the subject of Chapter 3, which concludes the less technical portion of the work, the remaining 12 chapters dealing with the physico-chemical analysis of the various latices, their properties; the specific gravity of latex; its viscosity; the coagulation process (with a list of works on coagulants); the production of whole latex rubber; preservation and shipping of latex; concentration, vulcanization of latex; industrial uses of latex; and the structure of rubber.

To avoid repetition, the author has touched but briefly on points that have already been thoroughly discussed by other writers, reserving fuller treatment for those recent discoveries for which less comprehensive data are available.

The work concludes with a 42-page list of patents by Dr. Carl Boehm von Boernegg, which, it is suggested, should prove valuable in determining the technical uses of latex, and the usual indexes of authors and subjects.

**"Die Welt der Vernachlassigten Dimensionen."** Wo. Ostwald. Ninth and Tenth Edition. Published by Theodor Steinkopff, Dresden and Leipzig. Paper, 341 pages, 6¼ by 9¼ inches. Illustrations, graphs.

In the winter of 1913-1914, the author, upon the invitation of a number of universities in the United States and Canada, visited 16 institutions and delivered a series of lectures on colloid chemistry, subsequently published in book form. The book by the clarity of exposition and simplicity of style, making a difficult subject easily understood, became extremely popular in interested circles and successive editions had to be printed.

In the present edition the lectures still form the basis of the work but have been extensively revised and the whole book enlarged to cover the latest developments in the important field of colloid chemistry.

The five lectures discuss the following points: (I.) The fundamental phenomena of the colloid condition. Colloids as disperse systems. The methods of producing colloid solutions; (II) The colloid system. The physico-chemical characteristics of colloids in their dependence from the degree of dispersion; (III) The changes in the colloid condition; (IV.) The scientific applications of colloid chemistry; (V.) The technical and practical applications of colloid-chemistry. Conclusion.

Rubber as one of the most important of the colloid industries receives ample treatment in the lecture on the technical and practical application of colloid chemistry and the most recent findings of such scientists as Hauser, Kirchhof, Katz, Pummerer, Spence, Feuchter, Freundlich, Le Blanc and Kroger, etc., are discussed.

An index of authors and one of subjects completes a work which will be heartily welcomed by all scientists and students in need of a comprehensive study of the vast subject of colloid chemistry.

**"Vanderbilt Note Book."** R. T. Vanderbilt Co., Inc., 50 East Forty-second street, New York, N. Y. Sixth edition, 164 loose-leaf pages, with flexible leather cover, pocket size.

### Review by W. C. Geer

This little handbook prepared in loose leaf form is a valuable contribution to practical rubber literature. It is a book without a title and yet it needs none for it speaks for itself. It lacks a stated purpose yet its purpose shines through each page for it presents condensed information and rubber data of value in the day by day work of the factory compounder.

The information presented is divided into certain groups. On the white sheets are general articles having to do with such subjects as units, cooperative research, keeping invention records, antioxidants, technical data on accelerators, and special articles covering different and important subjects in the rubber industry. To list them all would but repeat the table of contents of the book. These brief stories of general interest are, some of them, more valuable than others, as perhaps might be expected in a book of this kind, since the space is so limited that an extended discussion is out of the question. Some few of them it seems to me are rather of a more general and perhaps vague character than one would expect in a data book; and some few others, such as the keeping of invention records, might be elaborated with marked advantage to the user.

On the green sheets is given a list of products sold by the R. T. Vanderbilt Co. After all, one must recognize that this handbook is issued primarily to be of sales value, and it is interesting to see how admirably the technical data with respect to the different products sold by the Vanderbilt company have been described upon these green sheets. Times certainly have changed! In the old days a chemical product was sold to rubber men under a trade name and the only way the rubber compounder had to determine what it was composed of was by the long method of chemical analysis. Nowadays the selling companies speak right up in meeting and give the chemical derivation, composition, physical and chemical properties, and the methods of use of the products they sell. It is a happy change.

On the yellow sheets have been gathered together data on specific gravities, volume costs, methods of computation, etc., over a wide range of subjects; these subjects having been chosen as the ones most likely to be of the most use to compounders. In the table of contents these are called "miscellaneous" data. It would be preferable to use the word "essential" data. Generally speaking, these data are admirably chosen and excellently put together. I would, however, rather see under "Crude Rubber," the comparative cost volume put upon a basis of 100, with deductions therefrom, than upon a market that is now ancient history. I will not attempt to point out technical inaccuracies, of which there are several, but rather to indicate that there are such, which the compounder may or may not wish to correct.

It would be a little easier if the general table were used giving the volumes for a range of specific gravities, and a table inserted giving the approximate specific gravities of materials, rather than giving in the tables for figuring, the specific gravities of materials, as shown on page 115. As a matter of fact, many of the specific gravities given do not precisely accord with those of the materials used currently in the industry. For approximate purposes, however, the table as given is excellent.

Some day when the book is revised it would be a good plan to put in thumb tabs, particularly in the parts covering these essential data, and also to add under the heading of "Solvents" those changes in specific gravity and weight per gallon brought about by changes of temperature.

Even though these few criticisms are made, I must compliment the R. T. Vanderbilt Co. on an excellent contribution to rubber literature, and to say that this company has succeeded in doing for the compounder what the foreword expresses the ambition to do; namely, to have made a contribution to the upbuilding of his profession.

## Financial and Corporate News

### Firestone Bond Issue

An issue of \$10,000,000 Firestone Tire & Rubber Co. of California 15-year 5 per cent bonds was brought out last month by the Cleveland Trust Co., Otis & Co. and the National City Co. at 96½, to yield about 5.33 per cent.

This issue is guaranteed as to principal and interest by the Firestone Tire & Rubber Co. of Ohio, which owns all the stock of the California company. The latter company was formed to manufacture and distribute Firestone products on the Pacific Coast, Hawaiian Islands, Philippine Islands and the Far East. The guarantor company has net assets of about \$72,000,000, against which there is no funded debt, and \$40,000,000 of net quick assets. Its net earnings for the year 1926 were \$7,632,000.

### Directors Ratify Goodyear Stock

A sufficient number of consents having been received from stockholders, directors of the Goodyear Tire & Rubber Co. authorized the exchange of the old preferred stock for new first preferred in the ratio of four shares of the old stock for five shares of the new. About \$65,000,000 par value of the old stock is outstanding and has 25 per cent accumulated dividends.

This action on the part of the directors completes the realignment of the company's finances under the plan worked out this summer, by which the securities put out in 1921 are replaced by new ones, having lower rates of interest and more favorable retirement provisions. It also paves the way for the eventual resumption of dividends on common stock. The new preferred stock is to be exchanged during the period of October 1 to November 30.

President P. W. Litchfield reported that unit sales for the first eight months of 1927 were more than 20 per cent ahead of the same period last year, and that the earnings for that period exceeded the total earnings for the twelve months of 1926. During August the company sold 1,632,241 tires, the largest month in the history of the company. September sales are well ahead of last year and prospects are good for the balance of the year. All the Goodyear tire factories have been working three shifts continuously throughout the year.

### India Tire & Rubber Co.

Operations for the seven months ended July 31 resulted in net profits of \$215,056.33, after all charges for interest, depreciation, and federal taxes. These profits, together with the addition of \$302,000 of new capital brought in through the recent sale of common stock, have aided materially in financing the increased volume of business. Sales continue to show increases over last year, the sales to July 31 having been 41 per cent in excess of the same period in 1926, in value. Increases in unit sales amounted to 110 per cent.

### Dividends Declared

COMPANY	Stock	Rate	Payable	Stock of Record
Akron Rubber Reclaiming Co.	Pfd.	2% q.	Oct. 1	Sept. 20
Boston Woven Hose & Rubber Co.	Com.	\$2.00 ex.	Nov. 15	Sept. 19
Cambridge Rubber Co.	Pfd.	1¼% q.	Oct. 1	Sept. 20
Dominion Rubber Co., Ltd.	Pfd.	1¼% q.	Sept. 30	.....
Faultless Rubber Co.	Com.	\$0.50 q.	Oct. 1	Sept. 15
Faultless Rubber Co.	Pfd.	1¼% q.	Oct. 1	Sept. 16
General Tire & Rubber Co.	Pfd.	1¼% q.	Oct. 1	Sept. 20
Goodyear Tire & Rubber Co. of California	Pfd.	1¼% q.	Oct. 1	Sept. 20
Goodyear Textile Mills	Pfd.	1¼% q.	Oct. 1	Sept. 20
Goodyear Tire & Rubber Co. (Canada)	Pfd.	1¼% q.	Oct. 1	Sept. 15
India Tire & Rubber Co.	Com.	\$0.45 q.	Oct. 1	Sept. 20
India Tire & Rubber Co.	Pfd.	\$1.75 q.	Oct. 1	Sept. 20
Intercontinental Rubber Co.	Com.	\$0.25 q.	Sept. 30	Sept. 24
Rubber Service Laboratories	Com.	\$0.60 q.	Sept. 20	Sept. 10
Seiberling Rubber Co.	Pfd.	\$2.00 q.	Oct. 1	Sept. 20

## New Incorporations

AMERICAN REFINING CORP., September 9 (New York), capital stock 500 shares of no par value. Ethel Eisenstat, 2 West 120th street; William Reitman, 1773 Madison avenue, both of New York City; Jacob Silverstein, 915 East 9th street, Brooklyn, New York. Principal office, New York County. To manufacture tires.

DALY'S GOLDEN RULE SHOE CO. NO. 3, August 4 (Massachusetts), capital stock 1,000 shares preferred, par value \$100 and 1,500 shares common of no par value. James M. Daly, president and treasurer, 398 Puritan Road, Swampscott; Henry J. Buckley, clerk, 95 Ashland street; John J. Donovan, director, 102½ Jefferson street, both in Lynn; all in Massachusetts. Principal office, Lynn, Massachusetts. To manufacture leather and rubber goods.

FIRESTONE TIRE & RUBBER CO. OF CALIFORNIA, August 25 (Delaware), capital \$20,000,000. A. L. Miller, T. L. Fray, Alfred Jervis, all of Wilmington, Delaware. Resident agent, Corporation Trust Company of America, duPont Building, Wilmington, Delaware. To manufacture and deal in rubber products.

F. R. HENDERSON CORP., September 12 (New York), capital \$200,000. Francis R. Henderson, Garardus J. M. Keulemans, Gerald E. Perry, all of 44 Beaver street, New York City. Principal office, New York City. To deal in crude rubber.

KAY-JAY TIRE & RUBBER CORPORATION, September 12 (New York), capital \$20,000. Paul Cohn, Frank E. Weiss, Henry J. Kalichstein, all of 1457 Broadway, New York City. Principal office, Manhattan. To manufacture rubber goods.

LEWIS TIRE & RUBBER CO., August 23 (New York), capital stock 200 shares of no par value. Joseph M. and Rebecca Stern, Henry Schlesinger, all of 30 West 181st street, New York City. Principal office, Kings County. To manufacture tires.

NATIONAL LATEN CO., August 20 (Massachusetts), capital stock 999 shares of no par value. Grafton L. Wilson, president, 245 Clinton Road, Brookline; Virgil C. Brink, treasurer, 131 Marshall street, Watertown; Alice T. Smith, clerk, 9 Fairfax Road, Milton, all in Massachusetts. Principal office, Boston, Massachusetts. To buy, sell and deal in rubber products.

STANDARD RUBBER WASHERIES OF AMERICA, INC., August 16 (New York), capital \$100,000. Daniel D. Kelmanson; Flora Nathan; Dorothy McDonald, all of 1501 Broadway, New York City. Principal office, Manhattan. To manufacture and deal in crude rubber.

STURDY SHOE CO., August 8 (Massachusetts), capital \$50,000. Timothy J. Kiely, president and treasurer, 9 Henry avenue, Lynn; John J. Sullivan, clerk, 25 Falcon street, East Boston; Arthur J. Manning, director, Bolton; Charles F. Manning, director, 28 Wilkins street, Hudson; J. Bernard Buzzell, director, 84 Warner street, Hudson, all in Massachusetts. Principal office, Hudson, Massachusetts. To manufacture and deal in rubber products.

TIDEWATER RUBBER CO., August 4 (Massachusetts), capital stock 2,000 shares of no par value. George S. Squires, president, 159 Main street, Reading; Claude Steinau, treasurer, 12th Road, Ocean Bluff; Maurice N. Abrahamson, clerk, 14 Colbourne Crescent, Brookline; Joseph P. McCabe, director, 139 West Squantum street, Atlantic; Timothy J. McKean, director, 77 Cambridge street, Boston, all in Massachusetts; Leslie S. Steinau, director, 110 West 34th street, New York City; Walter G. Legge, director, 2062 East 29th street, Brooklyn, New York. Principal office, 4 Cleverly Court, Quincy, Massachusetts. To manufacture and deal in rubber merchandise.

### Akron Rubber Stock Quotations

Company	September 22, 1927	Bid	Asked
Akron Rubber Reclaim.	.....	17	18
Akron Rubber Reclaim. pfd.	.....	95	100
Falls	.....	4½	.....
Faultless	.....	37¾	40½
Firestone	.....	.....	162
Firestone, 6% pfd.	.....	106	106½
Firestone, 7% pfd.	.....	105¼	.....
General	.....	165	175
General, 7% pfd.	.....	.....	110½
Goodrich	.....	81½	82½
Goodrich, pfd.	.....	107½	108½
Goodrich, 6½% s.	.....	107½	107½
Goodyear	.....	61½	62¾
Goodyear, 1st mtg. 8s.	.....	120	120½
Goodyear, 5½ 57.	.....	94¾	95½
India, com.	.....	24½	25½
India, 7% pfd.	.....	.....	92
Mason	.....	1¼	2½
Mascn, pfd.	.....	15¼	16¼
Miller	.....	23¾	27
Miller, 8% pfd.	.....	99	99½
Mohawk	.....	18	70
Rubber Service Lab.	.....	38	42½
Seiberling	.....	36½	37
Seiberling, 8% pfd.	.....	100¾	.....
Star	.....	1½	2
Star, 6% pfd.	.....	.....	25

### New York Stock Exchange Quotations

	September 23, 1927	High	Low	Last
Ajax Rubber, com.	.....	83½	83½	84½
Fisk Rubber, com.	.....	17¾	17	17½
Fisk Rubber, 1st pfd. (7)	.....	95½	95	95
Fisk Rubber, 1st cv. pfd. (7)	.....	100¾	100¾	100¾
Goodrich, B. F. Co. (4) com.	.....	85½	83	84½
Goodrich, B. F. Co. (7) pfd.	.....	109½	109½	109½
Goodyear Tire & Rubber, com.	.....	65½	63¾	64
Intercontinental Rubber, com.	.....	12¾	12½	12½
Kelly-Springfield Tire, com.	.....	30	28¾	29½
Kelly-Springfield Tire, 6% pfd.	.....	89¾	87¾	89¾
Keystone Tire & Rubber, 8% pfd.	.....	92¾	90	92
Lee Rubber & Tire, com.	.....	¾	¾	¾
Miller Rubber, com. (2)	.....	15	14½	14½
United States Rubber, com.	.....	56½	54½	55¾
United States Rubber, 1st pfd. (8)	.....	100¾	100¾	100¾

# The Rubber Industry in America

## Ohio

A falling off in automobile tire production, following record breaking output in the last eight months, and increased production of rubber footwear marked the trend of operations for the rubber industry in Ohio during September. Since about the first of the month the leading tire manufacturing companies have been gradually curtailing production, until they are now running at approximately 85 per cent of capacity. Many departments, particularly mill rooms and calendaring units, are working five days a week. Working hours of the night shifts also have been cut down.

Total tire output in the Akron district now is estimated at about 130,000 tires a day, compared with more than 140,000 in August. Some easing up from the rapid pace set during the past few months was to be expected, however, and the tire situation is nothing more than normal and seasonal. Present operating schedules are considerably above those in effect at this time last year.

Curtailments of 10 to 15 per cent in output are understood to have been made in tire manufacturing departments at the Goodyear, Firestone, Goodrich and Miller plants. On the other hand, increased activity is noted in the rubber footwear units of Goodrich at Akron, and Firestone in Hudson, Massachusetts.

Besides record breaking sales, the most encouraging factor has been the excellent earnings reported by the well managed rubber companies. In the case of Goodyear, Goodrich, Firestone, General, Seiberling and others, net income in the first eight months of the year has been well in excess of profits previously reported for the entire year of 1926.

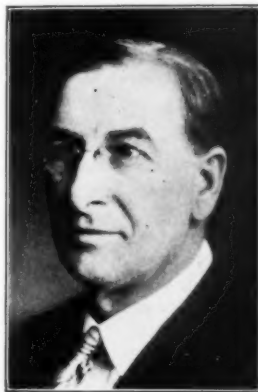
A comparatively stable crude rubber market has contributed no little to the prosperity of the rubber industry, in the opinion of Akron authorities. While rubber prices have eased off somewhat in the past few months, support from the rubber buying organization has prevented any drastic break, which would precipitate price cutting of finished products.

Harry Hough, formerly vice president and comptroller of The B. F. Goodrich Co., has been named president to succeed B. G. Work, at a special meeting of the board of directors.

**Goodyear-Zeppelin Corp.,** Akron, Ohio, subsidiary of the Goodyear Tire & Rubber Co., is expected to receive the contract in the near future for construction of the new dirigible airship for the U. S. Navy department. P. W. Litchfield, president of Goodyear, and W. C. Young, manager of aeronautics, recently conferred with Secretary of the Navy

### Rubber Consultant

John Hadfield was born February 14, 1874, in Sheffield, England, but came to the United States while very young. Forced to begin earning his living while still a mere boy, he learned the plumber's trade, his association with the rubber industry beginning in 1901 when he found employment in the development department of the Diamond Rubber Co., Akron, Ohio. He remained with this organization until October,



John Hadfield

1904, and then started in business for himself at the beginning of the following year continuing to sell rubber goods up to December, 1909.

In January, 1910, Mr. Hadfield established the John Hadfield Rubber Co., Akron, Ohio. In 1912 the name of the organization was changed to the Hadfield Rubber Co., Mr. Hadfield continuing to act as president and general manager, while his two brothers were associated with him in the plant operations. Still another reorganization followed in 1913, when the trade name became the Lincoln Rubber Co. Mr. Hadfield having sold all his rubber manufacturing interests is now maintaining offices as a practical rubber consultant at 174 Cole avenue, Akron, Ohio.

Wilbur and E. P. Warner, his assistant, on the terms. It is believed that work may be started on the ship this fall.

C. Reed Hill, assistant chief of the Rubber Division of the Department of Commerce, will be in Akron from October 4 to 15 for consultation with rubber manufacturers.

**General Tire & Rubber Co.'s** salesmen, numbering 160 from all parts of the country attended the annual conference and school at the Akron plant during the week of September 19, when talks on tire manufacturing and selling were given each day by heads of departments and company executives. The salesmen were guests of the company in the evenings at dinners and entertainments in the City and Portage country clubs. Herman Kraft, formerly tire development engineer with Goodyear is now in General's development department.

**India Tire & Rubber Co.** held conferences for more than 100 salesmen at the company's plant in Mogadore, Ohio, during the week of September 19.

**India Machine & Rubber Mold Co.** reports that this year's business is the best in its history. Demand for India cores and chucks has kept the factory at Akron unusually busy.

**The Goodyear Tire & Rubber Co.,** Akron, Ohio, reports that Maurice M. Cryder and George W. Heathman, designing engineers, have been transferred to the technical department of the company's Toronto factory. C. H. Williams, former vice president and sales manager of the Mason Tire & Rubber Co., now is a Goodyear tire sales specialist. G. M. Hartline and H. H. Garman were recently presented with 25-year service pins by President P. W. Litchfield. They also received \$250 in gold.

**The B. F. Goodrich Co.,** Akron, Ohio, announced that Gates Ferguson, recently appointed manager of national advertising, has been promoted to advertising director in charge of all Goodrich advertising, thus combining the national and local advertising departments. Frank Tucker, who formerly was in charge of dealer advertising, is now Goodrich branch manager at Toledo, Ohio. He is succeeded by P. J. Kelly, former Mason advertising manager. The company has recently placed on the market the Commander line of tires to compete with the second grade tires of other companies.

**E. E. Pardee,** export sales representative of the Firestone Tire & Rubber Co., was a visitor at the Akron plant recently after three years in the Far East. He has spent the past year in promoting Firestone sales and service in India,



Plant of the Erie Foundry Co., Erie, Pennsylvania

Ceylon and Burma. Mr. Pardee joined the Firestone company in 1911.

**The Mohawk Rubber Co., Akron, Ohio,** announces the transfer of T. D. Struthers from the managership of the Los Angeles branch to the general sales manager's staff at the home office. Mr. Struthers is among the most experienced younger men of the Mohawk organization, having served as assistant sales manager for the old Portage Rubber Co. and sales manager with The Williams Tire Corp.

### India Tire Activities

A conference of the India Tire & Rubber Co.'s branch managers will be held at the plant in Akron, Ohio, about September 15, to formulate policies and plans for increased sales.

Negotiations have just been completed with six tire dealers to handle the India line of tires, tubes and repair materials. The new accounts are: Up-to-date Tire & Battery Shop, Grand Rapids, Michigan; Greenwood Grocery Co., Greenwood, Mississippi; H. L. Cook & Co., Duluth, Minnesota; John Cock Tire Co., Birmingham, Alabama; Sunrise Tire Sales Co., Boston, Massachusetts; and the Broadway Viaduct Tire Co., Knoxville, Tennessee.

Two additions to the sales force are F. A. Sthorer, operating from the Akron branch, and C. J. Fowkes, working from the San Francisco branch.

J. M. Alderfer, president, and J. A. Andreoli, export manager, sailed September 20 from New York on the S. S. President Roosevelt for a trip to Europe to visit dealers and representatives of the company. While abroad they will visit the International Trade Exhibit at Salonica, Greece, early in October, and the Vienna Trade Fair, returning to this country early in December.

The countries in their itinerary include Great Britain, Holland, Germany, Sweden, Denmark, Czechoslovakia, Austria, Hungary, Greece, Switzerland, Spain and Portugal.

**The United Rubber Machinery Exchange,** 317-23 Frelinghuysen avenue, Newark, New Jersey, has opened a new warehouse at 241 Furnace street, Akron, Ohio, which is equipped with a railroad siding and all facilities to handle machinery promptly and efficiently.

**Harold H. Offutt** has resigned as chief chemist of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, and become chief chemist of the Lambert Tire & Rubber Co., Akron, Ohio.

**Paul M. Aultman** is now chief chemist of the Mason Tire & Rubber Co., Kent, Ohio, having resigned from his position in the sales department of the Rubber Service Laboratories Co., Akron, Ohio.

### Elko Chemical Co.'s New York & Akron Offices

The Elko Chemical Co., Nitro, West Virginia, maintains sales offices at Akron, Ohio, and is represented in New York by William S. Gray & Co., 342 Madison avenue. The officers of the company are: E. J. Smail, jr., president; Carl N. Hand, vice president; and C. O. North, secretary and treasurer. These men, with Francis Seiberling, Akron, Ohio, and W. D. Payne, Charleston, West Virginia, constitute the board of directors.



New Branch Building of the Goodyear Tire & Rubber Co., Broad and Somerset streets, Philadelphia, Pennsylvania.

### Rubber Machinery Division Established by the Erie Foundry Co.

Announcement has been made by the Erie Foundry Co., Erie, Pennsylvania, of the establishment of a rubber machinery division. The new department will be managed by J. A. Himrod, well known in the rubber industry with which he has had various connections, at one time as head of a concern specializing in rubber machinery.

For over thirty years the Erie company has been engaged in the manufacture of heavy machinery principally for heavy forging and drop forging industry and for sheet mills. The directors decided on diversifying the product and considered that rubber machinery offered the greatest possibilities in this line. They have been building up a personnel in the sales and engineering department capable of establishing the same prestige in the new line that has long been enjoyed among clients in the past.

The company has a modern, well equipped plant, with pattern shop, foundry and machine shop department, and very little equipment was required for the new department. This has been installed, designs prepared and experimental work finished for a complete line of hydraulic presses, mills, refiners, washers, tubers and strainers, in which the company plans to specialize, and which it is now presenting to the trade.

**Ralph W. Philbrook** has been appointed sales manager of the Converse Rubber Shoe Co.'s Philadelphia branch, succeeding C. W. Koch, who will cover Pennsylvania territory for this company.

**Albert K. Dannenbaum**, treasurer of The Schwarzwaelder Co., Philadelphia, Pennsylvania, has returned from a business trip to Europe.

## Massachusetts

Activity in the rubber footwear industry has overshadowed all other branches with the opening of the fall season. Continued wet weather throughout the country this summer, better conditions in the South due to higher crop prices, and the low state of dealers' stocks due to the generally heavy winter of last year have all contributed to the increased volume on boots, heavy arctics, lumbermen's and gaiters, fancy gaiters and gum shoes. The Hood plant is running at capacity on footwear with sales 25 per cent ahead of last year. Converse, Cambridge, Firestone and the United States plants in this section are all running full time with orders booked for three months ahead.

The Fisk Rubber Co.'s operations for July and August and a preliminary estimate for September definitely indicate that the company will earn more in the current quarter than for the previous eight months ended June 30. President H. A. Dunn is very optimistic over the outlook, pointing out that the present ideal weather will stimulate tire sales. Fisk is well covered on its cotton and rubber requirements. Even allowing for seasonal drop in production and sales in the closing months the company seems almost certain to earn at least \$2.25 for the 14 months' fiscal period or substantially more than the \$2.23 a share reported for the October 31 fiscal year.

Herbert O. Phillips, of Pawtucket, Rhode Island, head of the Phillips Insulated Wire Co. in that city, is becoming quite actively affiliated with the rubber industry of New England. He is president of the Appleton Rubber Co., Franklin, the Taunton Rubber Co., Taunton, and a director in the Stedman Products Co., Braintree, all in Massachusetts.

The Alden Rubber Co., which recently purchased the Middlesex plant at Reading, Massachusetts, has started production on a varied line of rubber specialties.

William H. Brawley, well known in the rubber industry through his former connection with the Firestone, Lancaster, and Converse companies, is now New England sales representative of Vansul, Inc., 90 West street, New York, N. Y., dealers in chemicals, pigments, oils and softeners for the rubber trade.

The United Shoe Machinery Corp., Beverly, Massachusetts, makers of rubber and leather shoe machinery, held the annual outing of its athletic association on September 10 at the clubhouse in

Beverly with over 30,000 people in attendance. The affair proved to be a miniature county fair with flower and vegetable shows, dancing, band concert, sports of all kinds, and was a reunion day for the company officials. George W. Brown, vice president of the corporation, who recently observed his 86th birthday, M. V. Bresnahan of the official staff, and George C. Thomas, general superintendent of the Beverly factory, were present.

The Tidewater Rubber Co., Cleverly Court, Quincy Point, Massachusetts, manufactures protoplasm reclaimed rubber under the S. & S. process. Officers of the company are: George S. Squires, president; Joseph P. McCabe, vice president; N. N. Abrahamson, secretary; Claude Steinau, treasurer; and Arthur C. Squires is the production manager.

Arthur Abbott has been made manager of footwear sales for the Tyer Rubber Co., Andover, Massachusetts. Mr. Abbott was formerly secretary and sales manager for A. J. Bates Co., Inc., New York, N. Y., later acting as sales manager of the Footwear Division of Hood Rubber Products Co., also of New York.

### Firestone Footwear

#### Elects Directors

The directors elected for 1927 for the Firestone Footwear Co., Hudson, Massachusetts, are: Harvey S. Firestone, J. W. Thomas, J. J. Shea, S. G. Carkhuff and B. M. Robinson, all of The Firestone Tire & Rubber Co., Akron, Ohio. C. M. O'Hearn is acting manager; C. E. Speaks, sales manager; and J. M. Miller, plant superintendent of the Hudson plant.

According to F. C. Adams, assistant treasurer, the volume of production was considerably increased by the addition of a new fireproof brick and concrete building in May, 1927.

### Chromilite Purchased By N. H. Sherardizing Co.

The New Haven Sherardizing Co., of Hartford, Connecticut, and Akron, Ohio, announces the purchase of all stocks and interest of the Chromilite Process Corp., Akron, Ohio. All creditors of the latter company will be guaranteed 100 per cent on the dollar. The New Haven company will operate the Chromilite division at Akron and under the same engineering organization.

### Converse Promotions

The Converse Rubber Shoe Co., Malden, Massachusetts, has made several changes in personnel, promoting men from the ranks to positions vacated by resignations. On the sales force, John F. Folan, New England sales manager, has taken over the Boston territory which he has covered since the inception of the company; part of his duties having been taken over by Wallace W. Lord, advertising manager, who now assumes the title of assistant sales manager.

In the manufacturing organization at Malden, Chester A. Emerson, superintendent, John A. Kelly, assistant superintendent, and E. L. Nute, plant engineer, have resigned, being succeeded by Edward F. Casey, in charge of production, Lawrence D. Ackerman, chemist, in charge of technical service, and Robert C. Kelley, purchasing agent, in charge of plant maintenance, all reporting direct to M. M. Converse, president.

Edward F. Casey, production superintendent, has been with the company since its inception in 1909, starting as odd ticket boy, and working up successively in charge of the ticket office, cutting department, packing, and shipping.

Lawrence D. Ackerman is a graduate of the University of New Hampshire, and started his rubber career with the Hood Rubber Co., fifteen years ago. He has been chief chemist of the old Hodgman Rubber Co., Beacon Falls Rubber Shoe Co., and came to Converse in 1919 as chief chemist from the latter company.

Robert C. Kelley is a graduate of Harvard, class of 1917, and joined the Converse company in 1918 at the close of the war. He has been in charge of the waste control and salvage department, cutting department, carton, stores, and fabric inspection, and in 1925 was with the Hood Rubber Co., doing special work in the heel and sole division. He rejoined the Converse organization April 1, 1926, as purchasing agent in charge of purchasing, stores, waste control, and salvage departments.

The Bibb Manufacturing Co., Macon, Georgia, announces the appointment of W. A. Woodruff as general superintendent. He was formerly in charge of the Porterdale plant, and later superintendent of the Columbus mill.

The York Manufacturing Co., Saco, Maine, is experimenting with waterproof fabrics, such as raincoat materials and other rubberized articles. The new display and salesrooms of the company, located at the top of York Hill close to the mill, will soon be completed.

## New Jersey

Rubber trade in New Jersey is reported as being very good at the present time. Tire and tube plants are busy and the output of mechanical rubber goods continues active. There is a fair demand at this time for rubber tiling and rubber goods used in the automotive trade, and shoe manufacturers are sending in orders for rubber heels and soles. Hard rubber goods are not selling very well at this time of the year.

**The Murray Rubber Co.,** Trenton, New Jersey, announces that mechanical rubber output has dropped off a little, but that tires and tubes are on the increase. The company is optimistic over the future.

**The Colonial Rubber Co., Inc.,** Yardville, New Jersey, was recently incorporated to take over the plant of the Enterprise Rubber Co., which went into the hands of a receiver some time ago. The concern has installed new machinery and is starting off with a good business.

**The Near-Para Rubber Co.,** Trenton, New Jersey, reclaimers of rubber reports that business continues to be good.

**F. P. Choate** has resigned as vice president and sales manager of the Murray Rubber Co., Trenton, New Jersey. Prior to joining the Murray company, he was for 15 years with Sears, Roebuck Co., Chicago, Illinois, and widely known in the automobile business, having established the tire and accessory business of the Chicago mail order house. **C. Edward Murray, Jr.,** president of the Murray Rubber Co., will for the present fill the position made vacant by the resignation of Mr. Choate.

**The Bergougnan Rubber Co.'s** former plant at Trenton, New Jersey, has been purchased by the Pennsylvania Railroad Co., from the Bergougnan Realty Co. The purchase price is said to have been approximately \$200,000.

**Mr. and Mrs. Charles E. Stokes, Jr.,** have returned after spending the summer at Spring Lake, New Jersey. Mr. Stokes is general manager of the Home Rubber Co., Trenton, New Jersey.

**Charles E. Stokes, Sr.,** president of the Home Rubber Co., Trenton, New Jersey, and Mrs. Stokes recently returned home after an extended tour through Europe.

**Whitehead Brothers Rubber Co.,** Trenton, New Jersey, continues busy in all departments with orders on hand to keep the plant running full time for some weeks.

**The Combination Rubber Co.,** Tren-

ton, New Jersey, reports a prosperous season and an increase in the output of tires and tubes.

**The Puritan Rubber Manufacturing Co.,** Trenton, New Jersey, announces that production in August was the largest in its history, the factory is operating night and day. The company recently installed considerable new machinery and is manufacturing floor tile of all kinds, perforated and corrugated mats, and cement for rubber, leather, tile and linoleum.

**C. Dudley Wilson,** secretary of the Luzerne Rubber Co., Trenton, New Jersey, is enjoying his vacation by traveling through the middle and far-western states. He will be absent for some time.

**C. Edward Murray, Jr.,** president of the Murray Rubber Co., Trenton, New Jersey, has returned from an extended business trip through the west and south.

**William W. McMahan,** vice president and general manager of the Ajax Rubber Co., Trenton, New Jersey, is back again from a business trip to Detroit, Michigan, and Racine, Wisconsin.

**The Ajax Rubber Co.'s** office workers and executive staff recently held an outing at Trenton, New Jersey. The committee was composed of Walter Gratton, William Smith, Thomas Prentice,

### WILL FORD PLANT RUBBER IN BRAZIL?

*A great deal of discussion has been going on in the press regarding the rumors of Henry Ford's activities in Para, Brazil. Despite denials from Mr. Ford, it is reported that several engineers employed by his company are now in Para studying the question, and that a purchase of over 1,000,000 acres is contemplated, which would render the Ford undertakings independent of British supplies.*

*The feasibility of the project is sound as shown in the report of the United States Rubber Plantations, Inc., which appeared in the September issue of THE INDIA RUBBER WORLD. The yield, by means of bud grafting, of 12 pounds of rubber per tree per year, or 1,200 pounds per acre of 100 trees, puts Para with its high priced labor in a position to compete with the cheap labor in the Far East, where yields are only 450 pounds per acre.*

Owen Evans, John Joyce, George Oakley, Hans Brunner and David Medkiff.

**Mr. and Mrs. Clifford H. Oakley** and daughter, Polly Oakley, have returned from a long cruise on their yacht *Quevida*. Mr. Oakley is president of the Essex Rubber Co., Trenton, New Jersey.

**Horace B. Tobin,** president of the Woven Steel Hose & Rubber Co., Trenton, New Jersey, is home again from a trip through Europe with his family.

**The Pierce-Roberts Rubber Co.,** Trenton, New Jersey, announces that it is busy in all departments and has many unfilled orders.

**William J. B. Stokes,** treasurer of the Thermoid Rubber Co., and president of the Joseph Stokes Rubber Co., Trenton, New Jersey, recently celebrated his 70th birthday anniversary by entertaining the members of his family at his home.

**Hamilton Rubber Co.,** Trenton, New Jersey, recently had as a guest Nate Bershon, president of the Bershon Tire Co., Los Angeles, California.

**The Lambertville Rubber Co.,** Lambertville, New Jersey, announces that it is operating seventeen salesmen direct from the factory. The St. Louis branch is featuring Snag Proof products only and from that branch the concern is operating twelve salesmen. Business is being received in good volume and much better production is anticipated at the mill than has been the case for the past two or three years.

**The American Rubber Products Corp.,** Jersey City, New Jersey, now makes all products formerly made by the Voorhees Rubber Manufacturing Co. The latter's plant is being dismantled and the property offered for sale. Officers of the American company are: A. Y. Tucker, president; H. S. May, secretary; A. W. Tomkins, vice president and factory manager.

**The Goodyear Rubber Co.,** Middletown, Connecticut, denies that the operations of the Lambertville Rubber Co., Lambertville, New Jersey, will be discontinued and the plant consolidated with the Middletown plant. While concentrating all sales efforts for the Middletown line at Middletown, Lambertville will continue to operate as a distinct unit as heretofore, according to F. E. Church, president of the Goodyear company.

**The Hatfield Rubber Works, Inc.,** has discontinued the main office, formerly located at 90-92 Academy street, Newark, New Jersey, and is now installed at the new plant, Hillside and Long avenues, Hillside, New Jersey.

PRACTICAL INFORMATION IN REGARD TO legal phases of foreign trade is contained in a series of brochures being published by the American Manufacturers' Foreign Credit Insurance Exchange and the American Manufacturers' Export Association.

## Goodyear's Western Manager

Albert Gerry Partridge, who last year was appointed the western division manager of the Goodyear organization, has been associated almost continuously with the rubber industry throughout his business career.

Born in Jamestown, New York, August 25, 1880, Mr. Partridge was educated in the schools of his native town, and in 1899 began work with the Diamond Rubber Co., Akron, Ohio, as clerk to the manager



A. G. Partridge

of the company's New York branch. He remained with the Diamond organization until 1905, when he became connected with the Firestone Tire & Rubber Co., Akron, Ohio, holding consecutively until 1921 the following positions: Department manager, assistant sales manager, general sales manager, and vice president in charge of sales and advertising. After five years of work in the real estate business, Mr. Partridge again entered the rubber industry, taking in 1926 the position with the Goodyear organization as mentioned above.

He is an enthusiastic Mason, the orders with which he is connected including the Scottish Rite, Commandery and Shrine. He is also a member of the Akron City Club, the University Club and the Portage Country Club of Akron. His home is at 67 Putnam Road, Akron, Ohio.

### BALLOON AIDS RESEARCH

An ingenious use was recently made of a toy balloon by two eminent Chicago scientists, Dr. Thomas Dyer Allen, ophthalmologist of Rush Medical College, and Frank Percy of the Department of Physiology, University of Chicago. Wishing to learn the cause of drowsiness after eating, one of the physicians swallowed while the other inflated a balloon to which a stomach pump had been attached. The subject soon became drowsy, showing all the symptoms of overeating, and the verdict of the two medicos was that distension of the stomach was the cause of the drowsy feeling experienced after a hearty meal.

## New York

A. Klipstein & Co., 644 Greenwich street, New York, N. Y., have announced a merger with E. L. Bullock & Sons, distributors of compounding ingredients. E. L. Bullock will be in charge of the rubber division of the new company assisted by E. L. Bullock, Jr., C. S. Bullock, J. H. Shearman and A. F. Stumpf.

J. R. Sweetman has resigned his position as chief chemist of the La Favorite Rubber Co., Hawthorn, and is now located on the chemical staff of the Hewitt Rubber Co., Buffalo, New York. Mr. Sweetman was employed for a number of years with the New York Rubber Co., Beacon, N. Y., and for a short while he was chemist with the Whitehead Bros. Rubber Co., Trenton, New Jersey.

The Dunlop Tire & Rubber Co., Buffalo, New York, has developed seventy-seven additional wholesale distribution points within the past forty-five days. These additions act as shipping points for Dunlop dealers in their respective trading areas and insure prompt service at all times.

Goodyear Sundries & Mechanical Co., 116 Chambers street, New York, N. Y., is enjoying a large volume of business and is booked up with sufficient orders to keep busy until the first of the year. The company claims to have a line which includes everything in rubber, its products comprising heavy mechanicals, light mechanicals, gloves, waterbottles and various accessories, sundries, oil goods, heavy rain clothing and ladies' rain apparel.

### Rubber Transmission Belt

The largest rubber transmission belt, it is believed, is the Serubco cushion center belt, recently furnished to the Bryant Paper Co., Kalamazoo, Michigan, by the Security Rubber & Belting Co., Chicago, Illinois. It is 72 inches wide, 12 ply in thickness, 142 feet 8 inches long and weighs 3,000 pounds. The belt operates at a speed of 4,400 feet per minute and is used on a Cross compound Corliss engine which develops 1,150 h. p. The engine fly wheel is 16 feet and the receiving pulley 9 feet in diameter, and a 5-foot diameter idler runs on the top or slack side. The belt was applied endless to the pulleys by means of a diagonal stepped splice, each step cemented and riveted.

H. E. Dennie is vice president and general sales manager for the Security company, and has had twenty-seven years successful sales experience in the rubber belting field.

## Chemical Sales Representative

It is most interesting to note the rapid advance to executive position of men of chemical education and technical training in the rubber trade and industry. A case in point is that of William H. Brawley, the subject of this sketch. He was born July 24, 1891, in Boston, Massachusetts, graduating from the public school system of that city to enter Harvard College, where he took his degree of A.B. in 1913. His first technical experience in rubber



W. H. Brawley

was obtained in the service of the United States Rubber Co. and its subsidiaries and with the Firestone Tire & Rubber Co., Akron, Ohio, where he specialized in compound development. Later he became chief chemist of the Iowa Cord Tire Co., Des Moines, Iowa, advancing next to the superintendency of the Panther Manufacturing Co., Stoughton, Massachusetts, makers of heels, soles, etc. Returning again to the tire division of the industry, Mr. Brawley became superintendent of Plant B. of the Lancaster Tire & Rubber Co., Lancaster, Ohio. This connection he recently severed to assume executive and sales duties as New England representative of Vansul, Inc., 90 West street, New York, N. Y., dealers in chemicals, pigments, oils, softeners, etc., for rubber compounding.

During the World War Mr. Brawley served as rubber technologist with rank as corporal, chiefly in the Mechanical Research & Development Division of the Chemical Warfare Service, U. S. A. His club affiliations are with the Association of Harvard Chemists and the Harvard Club of Medford, Massachusetts.

### MEXICAN GUAYULE EXPORTS INCREASE

Guayule exports from Saltillo, Mexico, during the first quarter of 1927 have totaled, according to the Department of Commerce, 600,000 pounds, against 469,700 pounds for the first quarter of 1926, with 450,000 pounds for the corresponding 1925 figure.

## Pacific Coast

Most of the tire companies manufacturing or distributing in Pacific Coast territory report production and sales as having decreased in some cases as much as 15 per cent, from the high peak of summer. As overstocking was largely the cause, it is said, an upturn is expected in a couple of months. Some of the smaller manufacturers state that they have suffered no setback whatever. On the whole trade thus far this year in the entire territory has been much better since January, in both unit sales and profits, than for the first nine months of 1926. Estimates of the business done annually in automobile rubber equipment and replacement for the Pacific Coast region vary widely, especially for the middle and upper sections; but they are in better accord for the southern district, total retail sales there in 1926 being conservatively put at over \$18,000,000. It is said that the 1927 figure will be well above \$20,000,000.

Mechanical rubber goods manufacturers were much relieved recently when oil companies again began to seek supplies in large quantities after several months of meager hand-to-mouth buying for field operations. With labor and weather conditions continuing favorable, the building trades continue as large buyers of staple goods; and fair headway is being made in placing rubber flooring in new office buildings, schools, etc., dealers' comment being that aggressive publicity is needed to offset adverse propaganda of makers of old-line floor coverings. To the prospect of early wet weather in the Northwest is attributed a much livelier market than usual for rubber footwear there. Boots and belting for mining, ranching, and heavy outdoor construction work are also in good demand.

**Goodyear Tire & Rubber Co.**, of California, and the **Goodyear Textile Mills**, both in Los Angeles, are working on full time, although output has eased down to an average of 6,000 tires and about the same number of tubes daily. The tire company recently passed its 9,000,000 mark, thus averaging over 1¼ million casings for each year since its start. Vice President and Factory Manager Cliff S. Slusser of the parent Goodyear company in Akron spent the past couple of weeks at the Los Angeles plant, and was much pleased with the progress being made there.

**The Firestone Tire & Rubber Co.** of California reports that the grounds for the new factory in Los Angeles are now being prepared for building operations,

and structural contracts will be awarded shortly.

**West American Rubber Co.**, 400 North Avenue 19, Los Angeles, California, will have a booth at the petroleum exposition in New York City, according to President Douglas Radford; and Vice President Charles Lamb will have charge of the exhibit. Business lately has been exceptionally good.

**United States Rubber Co.**'s sales for September were well above those for the same month in 1926, according to Pacific Coast Division Manager J. B. Brady of San Francisco, and he is confident that 1927 will show a considerable improvement over last year. He has recently had as a business guest Los Angeles Branch Manager J. B. Magee.

**Samson Tire & Rubber Co.**, Compton, California, according to President Adolf Schleicher, has been making considerable headway of late, the demand, especially for bus tires, requiring the plant to employ two shifts continually in nearly all departments.

**R. & H. Chemical Co.**, El Monte, California, a subsidiary of the Roessler & Hasslacher Co., of New York, has completed major experimenting in the production of regenerated rubber, and is now producing an average of six tons daily of standard reclaim, for which it reports a steadily increasing demand. It has lately accumulated a huge amount of old material for reworking.

**Coast Tire & Rubber Co.**, Oakland, California, reports business as very good, and that its plan of merchandising tires through factory branches direct to consumers has proved very successful. A considerable economy has been effected through the elimination of an expensive selling staff. President J. C. Hughes and Vice President and General Manager Louis S. Budo are in the East making a survey of business conditions and they intend to visit some of the largest tire plants with a view to bettering the equipment and output of their factory.

**Pennsylvania Rubber Co.** Jeanette, Pennsylvania, announces the appointment of H. H. Boucher as Southern California and Arizona manager. Mr. Boucher was formerly with the Kelly-Springfield Tire Co., and for the past six years had been with the The B. F. Goodrich Co., in charge of pneumatic tire sales at the Los Angeles branch. Catlin Wolfard has been appointed western manager, with headquarters in San Francisco. The Pennsylvania company has also established a northwest

branch at 95 North 12th street, Portland, with John S. Bathrick in charge.

**Pioneer Rubber Mills**, San Francisco, California, reports that H. M. Sutherland, foreign representative of the company, has left for India and will look after the steadily growing Pioneer business in that country. Vice President D. D. Tripp, in charge of sales, is making a tour of the Pacific Coast branches of the company.

**Keaton Tire & Rubber Co.** plant, good will, and patents have been taken over by a new organization, Rubber Corp. of America. A. H. Clark is president and R. H. Keaton, who was at the head of the old company, will be in charge of tire production at the well-equipped factory, 16th and Kansas streets, San Francisco. Well manned and financed, the new concern intends to start an aggressive selling campaign, featuring moderate priced casings in the more popular sizes.

**Beyerle Manufacturing Co.**, 224 East 11th street, Los Angeles, California, of which Edward Gross is vice president and manager, reports a constantly increasing sale of its products, rubber aprons and other light toilet articles of rubber. Its main factory is in New York City. Formerly the latter shipped finished goods to the Pacific Coast, but now it sends rubber suitably sheeted to be fabricated in the Los Angeles plant, a marked saving is said to be the result of the change.

**The Golf Tournament** of the Pacific Coast makers and distributors of mechanical rubber goods, October 3 and 4, promises to eclipse in interest all preceding annual contests. The Ambassador Hotel, Los Angeles, will be headquarters, and the games will be played at the Rancho Golf Club links, Culver City. A banquet will follow at the Rancho clubhouse. The committee in charge consists of William Art Corder, W. Clyde Hendrie, J. D. Horan, and Frank M. Beall; with J. B. Lippincott, of San Francisco, as treasurer.

**Thermoid Rubber Co.**'s sales of brake lining and mechanical rubber goods on the Pacific Coast during the first six months of this year were considerably larger than for the same period of 1926, according to Pacific Coast Manager James A. Wheatley, Jr. Many new distributors have lately been added to the Thermoid force.

**Universal Rubber Manufacturing Co.**, San Francisco, California, at its recent annual meeting elected these officers: George M. Stevens, president; John L. Moore, vice president; John V. Filippini, secretary-treasurer; all of whom with Felix Butte and D. T. Rogers are directors. The company recently added two large presses and an electric water cooling system.

The B. F. Goodrich Co. plans to start work actively on its 46-acre Los Angeles plant about October 1 and to be on a production basis by March 1, 1928, daily output being about 5,000 tires and 7,500 tubes. The first unit will extend along East 9th street 1,800 feet, and will contain many unique features for expediting manufacture. The grounds are all ready, and the steel for the buildings, which will provide 400,000 square feet of floor space, is being rapidly fabricated. H. M. Bacon, Pacific Coast manager, of San Francisco, was recently called to Detroit, where his mother is seriously ill. George Sawin, of Akron, Goodrich tire sales manager, was a recent Pacific Coast visitor.

**Plant Rubber & Asbestos Works**, San Francisco, California, reports sales of heavy hose, belting, packing, and engine room supplies as much above those of a year ago. President and Manager Sydney L. Plant who recently returned from a four months' trip to Japan, China, the Philippines, Australia, and New Zealand, secured many large orders in those countries and established many new connections that promise well for considerable overseas trade. He stated that everywhere he went in the Orient he found a very friendly attitude toward American manufacturers, and that the major rubber companies of the United States are enjoying a good volume of trade. He was much impressed with the hospitality extended by all their representatives, and is especially enthusiastic about American rubber prospects in China when political disturbances quiet down.

**Gates Rubber Co.**, Denver, Colorado, according to Export Manager F. H. Nassimbene, now sells its products in fifty-two foreign countries; and in the first six months of 1927 the value of such sales was 116 per cent greater than in the first half of 1926. The honor of heading the Gates "Top Hundred List" of picked jobbers in fan belts, radiator hose, etc., has again been conferred on the E. A. Featherstone Co., Los Angeles, California, which has retained that distinction five years.

**Ira B. Holloman** has been transferred by the Mohawk Rubber Co., Akron, Ohio, from the home office to the Los Angeles branch of which he has been made manager.

**F. L. Ryan**, San Francisco branch manager of the India Tire & Rubber Co., Akron, Ohio, recently made an extensive trip through Washington and Oregon to prepare sales plans and secure additional distribution for 1928.

**CRUDE RUBBER REEXPORTS FROM THE United States** for the six months ended June, 1927, according to the Department of Commerce, totaled 28,833,839 pounds, valued at \$12,452,275.

## Midwest

**The White Truck Sales Co.**, Phoenix, Arizona, will soon open two new service stations in Douglass and Bisbee, Arizona. The firm has branches in Tucson, Globe and Prescott, Arizona, which carry White trucks and India tires.

**H. B. Noyes**, of Noyes & Boyle, tire dealers of Omaha, Nebraska, visited the plant of the India Tire & Rubber Co., Akron, Ohio.

**Carl A. Burton**, of the Carl A. Burton Service Station, Kansas City, Missouri, was another visitor to the India plant.

**The Akron Tire & Vulcanizing Co.**, India tire dealer in Chicago, Illinois, is opening another store at 5101 South Wabash street.

**The Firestone Tire & Rubber Co.**, Akron, Ohio, has opened a branch building in Duluth, Minnesota, to care for dealers in northern Minnesota, upper Michigan and northern Wisconsin. The new building was erected at a cost of \$125,000. Irving W. Lee is manager.

**The Servus Rubber Co.**, Rock Island, Illinois, has added a full line of waterproof footwear to the list of its products and is also equipped for manufacturing tennis, sport and basketball shoes. According to T. A. Maguire, president, the plant is entirely sold up on both units to December 31.

**Charles H. Lindsly** is now chemist in the development department of the tire division of the United States Rubber Co., at its Morgan & Wright plant, Detroit, Michigan.

**The Prentice Tire & Rubber Co.**, 325 North Delaware street, Indianapolis, Indiana, is now owned and operated by the Baron & Reynolds Tire & Rubber Co. The company specializes on high class guaranteed retreading and expert tire and tube repairing, catering to the wholesale and used car dealer. The factory production, with present machinery and equipment, is forty-five tires. E. E. Baron was formerly general manager of the Prentice company, and A. N. Reynolds was associated with the Sante Fe Railroad Co.

**The Century Rubber Works**, 54th avenue and 18th street, Chicago, Illinois, has announced the appointment of L. J. Wathier, formerly Pacific Coast district manager, as Chicago branch manager. R. Brelie has been promoted to the position of service manager, replacing William Stucky. Mr. Brelie is an old timer in the tire industry and has been with the company for the past three years. Previous to his association with the Century, he was assistant factory superintendent for the Coast Tire & Rubber Co., Oakland, California, and

had been connected also with the Gillette Rubber Co. and the Federal Rubber Co.

**M. W. Clark** has been made special representative in the Chicago district for The Republic Rubber Co., Youngstown, Ohio. Mr. Clark has been connected with the Republic company twelve years.

## Century Rubber Works

Increased business has forced the Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois, to move its Buffalo, New York, branch into larger quarters in the Larkin Terminal Warehouse, 189 Van Rensselaer street. L. N. Einsel is branch manager.

For the second time within a year it has been found necessary to move the New York City branch. The new location is in the Baltimore & Ohio Stores Building, 26th street and 11th avenue. The move was necessitated by the large increase in business in that section.

Another change in branch location, because of large volume of business, is in Minneapolis, Minnesota, the new quarters being in the Colonial Warehouse, 216 3rd avenue, North. This branch is in charge of R. C. Stubbins.

A new branch has been opened in Oklahoma City, Oklahoma, and is located at 306 North Broadway. Earl W. Bentley is in charge.

## RUBBER STOP POSTS

Rubber stop and go posts about two feet high have been installed in some of the busy streets of Chicago, and damage to post or driver believed to be considerably lessened in case of accident. If the motorists run over the signposts they bend flat to the pavement, springing back to position immediately pressure is removed.

## MADE FIRST M. & W. TIRE

Louis M. Dreves, new Pacific Coast supervisor of sales for the Oakland Motor Car Co., Oakland, California, is credited with having made from factory drawings in 1904 the first automobile tire produced by Morgan & Wright of Indianapolis, Indiana, after that concern, having done a great business in bicycle tire making, decided to pioneer in making double tube pneumatics for motor cars. Mr. Dreves had entered the factory when he was 17, but since 1908 he has been selling automobiles, for the past nine months being one of the leaders in the Chevrolet sales organization. The first M. & W. tires were of the smooth-faced clincher type, having five plies of rubberized cotton duck or building fabric, with single covers of tough rubber, very thick tread and tapering to the beads.

## Canada

Since the price of tires is down in comparison with last year, manufacturers find the 1927 volume is about equal with that of 1926, notwithstanding the fact that more tires are being sold. Through the increasing number of automobiles on the road the number of tires sold is greater but no difference has been noticed in the volume of business done. The market on rubber goods generally is very steady at present, with no indication that a change in price is expected. The increase in cotton has had no effect on prices of tires and mechanical rubber goods. The holiday season gave the trade the usual rush of orders for tires and sales compared very favorably with those of last year. Hose, belting, etc., have maintained a fairly steady market all season. There is nothing new to report about rubber footwear, and no change in prices is looked for before January 1. The higher price of cotton should have a tendency to make for a higher level of values, but there is such a keen competition between rubber factories for business these days that it may be the manufacturers will try to absorb it rather than do anything that might discourage new business.

**Canadian Goodrich Co., Ltd.**, Kitchener, Ontario, at a recent directors' meeting declared the interest of  $3\frac{1}{2}$  per cent for the first half of 1927 on the company's income bonds. A plant extension was also provided for increased capacity. The company has sent out attractively printed showcards displaying the Softball King and other rubber-soled athletic footwear manufactured by the Goodrich Company.

**W. H. Miner**, vice president of the Miner Rubber Co., Ltd., Montreal, and a prominent member of the Quebec Division Canadian Manufacturers' Association has contributed much in Quebec Province to the improvement of cattle, having established pure bred stock on his farm.

**Seiberling Rubber Co. of Canada, Ltd.**, announces that the new factory in Toronto will be devoted to the manufacture of druggists' sundries crowded out of the main plant by the expansion of the tire business and the installing of additional tire making machinery. Over four hundred dealers have signed an exclusive franchise in three months and six hundred are anticipated by the end of September.

**Northern Rubber Co., Ltd.**, Guelph, Ontario, has placed on the market the Court Special, a sports shoe for Badminton, which is a heavy white duck shoe with white foxing, heavy crepe sole, and

also Keneva sole, made up in men's and women's styles of Oxford with high fronts.

**Miner Rubber Co., Ltd.**, Montreal, Quebec, following extensive experimental work has evolved a new high grade rubber sole called Tuff Sole due to its unexcelled wearing qualities.

**W. O. Cutter** of the United States Rubber Co., New York, N. Y., addressed the Canadian Society of Cost Accountants on "Costs in the Rubber Industry," at the second annual convention which took place at McGill University and the University of Montreal, September 7 to 9. The convention was concluded with a banquet at the Windsor Hotel.

**J. Bryant**, representative of the Kaufman Rubber Co., Ltd., Kitchener, Ontario, has returned to Toronto from a six weeks' trip to England where he visited his home town, Bristol.

**North British Rubber Co., Ltd.**, Toronto, Ontario, is now on the road with a full line of rubber goods manufactured by this British firm with factories in Edinburgh, Scotland, and a branch in Toronto to fill Canadian requirements.

**Dominion Rubber Co., Ltd.**, with twenty service branches, reports that all manufacturing departments are actively engaged in producing the various lines so justly popular and in demand with the trade throughout Canada.

**Goodyear Tire & Rubber Co. of Canada, Ltd.**, New Toronto, Ontario, plant is running at capacity on a 24-hour schedule with prospects of maintenance of this rate for several months to come. In addition to the Canadian trade, exports are going forward to 87 countries, which will more than make up for the loss of the English export trade. The seventh annual picnic of the Goodyear Recreation Club held recently at Eldorado Park, twenty-five miles from New Toronto, was the largest gathering that ever attended a Goodyear picnic. F. C. Megan, recently in charge of the Service and Adjustment Department of the Montreal branch, is now a salesman traveling out of the Montreal branch. He is succeeded as service manager by E. Roberge.

**W. J. Farren**, of the Dunlop Tire & Rubber Goods Co., Ltd., St. John, New Brunswick branch, and Mrs. Farren recently celebrated their twenty-fifth wedding anniversary, and received a large number of handsome and useful gifts consisting of silver, cut glass, etc.

**Professor Francis E. Lloyd**, MacDonald professor of botany, McGill University, has returned after spending the summer in research work on the guayule

rubber plant, as a guest of the Continental Rubber Co., of New York, at the experimental station at Salinas, California. Professor Lloyd is a foremost authority on guayule.

**Hamilton By-Product Coke Ovens, Ltd.**, Hamilton, Ontario, will build a large plant for the manufacture of toluol at a cost of about \$400,000. The contract for the construction of the plant has been let and from 100 to 150 workmen will be employed for the next six months in building it.

**Nova Diatom Products Co., Ltd.**, Digby Neck, Nova Scotia, is developing a large deposit of diatomaceous earth which is said to be the only one known on the Atlantic seaboard and it is estimated to contain at least 1,000,000 tons of the earth.

**National Rubber Co.**, Toronto, Ontario, is featuring Vul-Tite products, which include tire plaster, and National pulled cord tire boots made of three- and four-ply cord fabric for high pressure and balloon tires.

**Estey & Co.**, St. John, New Brunswick, who have been handling rubber goods, exclusive of tires and tubes, for thirty odd years have recently taken on the sale of these products.

**Allock, Laight & Westwood Co., Ltd.**, Toronto, Ontario, are Canadian agents for the Airubber Corp., Chicago, Illinois, whose products are said to be popular in the Dominion.

### PERUVIAN TIRE CONCESSION

A concession to manufacture automobile tires and tubes was granted by the Peruvian government to Ugo Tomenotti, "La Colonizadora," Hotel Bolivar, Lima, Peru, for the Department of Loreto. According to the concession the industry shall be established within one year from June 17, 1927; the products must bear a special mark either raised or depressed; and the state will be paid 15 per cent of the profits of the company and can appoint a representative before the company.

### RETREADING CONCESSION GRANTED IN PERU

A ten-year concession for retreading tires was granted by the Peruvian government to Gonzalo Ortiz de Zavallos, Calle Nunez 227, Lima, Peru. The terms of the concession include: the industry must be introduced within two years; capital shall not be less than 10,000 pesos; 10 per cent profit on costs is the maximum permitted; the industry must be established within one year in the departments of Loreto or San Martin and Madre de Dios to validate patents in those departments; and a guaranty of 500 pesos shall be deposited with the government.

# The Obituary Record

## A Great Industrial Leader

AMERICAN industry suffered the loss of another great captain in the passing of Bertram G. Work, president of The B. F. Goodrich Co., whose death occurred unexpectedly August 30 at the Palace Hotel, St. Moritz, Switzerland. Mr. Work had gone abroad a month before for a rest, and up to within a few hours before he was stricken with paralysis of the heart he had apparently been in good health. With him when he died were two friends, Mr. and Mrs. Alexander H. Revell, of Chicago, Illinois.

Born on Staten Island, New York, January 9, 1868, Mr. Work was a son of Alanson Work, who, with Dr. B. F. Goodrich, was one of the incorporators of The B. F. Goodrich Co., becoming its vice president and general superintendent. In 1880, the family moved to Akron, Ohio, in which city the Goodrich concern was the pioneer in rubber manufacturing. After graduating from Williston Seminary, young Bertram entered Sheffield Scientific School at Yale with the class of 1889. Because of the death of his father he left college after his freshman year to learn the factory end of the rubber business in the Goodrich plant, starting at the bottom and working in every department. He first attracted the attention of Dr. Goodrich by riding one of the first high wheel bicycles from Cambridge, Massachusetts, to Akron, Ohio, a very considerable feat.

After but eighteen months of service, Mr. Work was made superintendent in 1892, became vice president in 1902, and on the death of Colonel George W. Perkins was elected president in 1907, thus serving the Goodrich interests for forty years, the latter twenty years as president, and becoming an outstanding figure in the world's rubber industry.

With unremitting zeal and industry he continued to build up his company, often the first to arrive and the last to leave, and he devised many machines and numerous methods to expedite work, curtail waste, enhance efficiency, and better production. He inspired enthusiasm with his energy and his appreciation of the help of his coworkers. The early administration of Mr. Work was marked by the consolidation with his company of the Diamond Rubber Co. in 1912, and by the first serious entrance of the American rubber industry into the international field.

During the World War he rendered great aid to the United States Government. To the surprise of his associates he handed over priceless secret formulas to his competitors. Wholly devoid of fear he went to Europe when submarines were doing their most destructive work. In recognition of his ability as an organizer and a rubber business expert, he was elected president of the Rubber Association of America. In addition to serving as chairman of the Rubber Division of the War Service Committee, he was chosen chairman in 1918 of the Special Liberty Loan Committee to represent the rubber industry of Greater New York, and personally subscribed \$25,000.

Early in 1923 he made a study abroad of the crude rubber situation and issued a statement, taking issue with many other leaders,

in which he justified the Stevenson Restriction Act as the most feasible measure for stabilizing the plantation industry. Later, touching upon the mooted question of the balloon tire basic patent, he urged the publication of all inventions before a final patent be granted in order to put American patents on a higher plane of validity and to prevent unwarranted grants and costly, needless litigation.

The B. F. Goodrich Co. became Mr. Work's one ambition. He cared not at all whether he received credit for what he did or not. An instance in point was the invention of the Haskell golf ball, which was actually his and which was revolutionary in its effect but which still goes under the name of the man who suggested but could not create it.

Bertram G. Work was not brilliant in a spectacular way, but as a student of rubber in all of its phases, of men from the laborer to the executive, of manufacture and of markets, he was tireless. Thus at the first mastering of all details he was able later to select capable men for all departments who relieved him of detail work while he went on to the more important duties of the great executive. His breadth of view is shown in the fact that while the successful rubber mills of the United States worked behind closed doors, he invited leaders in the industry, French, British, Italian, German, Japanese and Russian to visit the Goodrich plant where he showed them everything. He in turn visited their factories and both sides profited by such interchange. This broadminded view eventually brought



Bertram George Work

about the establishment of overseas Goodrich factories.

Mr. Work was a trustee of the Equitable Trust Co., a director of the E. W. Bliss Co., Continental Caoutchouc and Gutta Percha Co. of Hannover, Germany; the Martha Mills, Inc., of Thomaston, Georgia, and the American Anode, Inc. He was a member of many clubs.

Mr. Work leaves a son, Bertram; two brothers and two sisters, one of the latter, Miss Effie A., having in 1908 married Dr. William C. Geer, vice president of the Goodrich company. Mrs. Work, who was Miss Marion Sawyer, of Easthampton, Massachusetts, died August 26, 1923.

Brief services were held September 14 at Mr. Work's eastern residence, Oak Knoll, Oyster Bay, Long Island. The funeral services were held in Akron, Ohio, September 15, with his former associates and officials of other rubber companies in attendance. Following services at the Church of Our Saviour, the body was taken to Glendale Cemetery, where final rites were performed before the family vault. Reverend George P. Atwater, former rector of the church and now of New York City, officiated, assisted by Reverend B. Z. Stambaugh, the present rector.

Dr. Atwater called attention to the ability and courage which had carried Mr. Work to the top in the rubber industry.

"He was a very religious man," he declared, although he gave little hint of it in his exterior bearing. Underneath though he was a kind and deeply religious human being, as those who came to know him well all learned."

### Widely Known Tire Man

Osborne Smith Tweedy, who died suddenly September 23 in St. Luke's Hospital, New York City, was born December 5, 1872, in Buffalo, New York.

Following his education in the grammar and high schools of that city he started in business in 1896 with the Eagle Iron Works. In 1888 he was appointed Buffalo branch manager for the Revere Rubber Co., following which he joined the Diamond Rubber Co. organization for a period of ten years, first in the credit department at Akron, and later as Chicago district manager. He then went to the Federal Rubber Co., Milwaukee, Wisconsin, as general sales manager, after two years going to the Continental Caoutchouc Co. in a similar capacity, and on its absorption by the United States Tire Co. was appointed assistant general sales manager of the latter company, followed in 1916 by promotion to general branch sales manager, from which office he resigned to join the C. Kenyon Co., Brooklyn, New York.



O. S. Tweedy

Mr. Tweedy was also identified with the Dryden Rubber Co., and in 1921 became general manager of the McKone Tire & Rubber Co. While acting in that capacity, in conjunction with John V. Mowe, he helped to organize Tweedy-Mowe, Inc., a national tire sales organization. Upon the sale of the McKone company to Mr. McKay in July, 1925, he became general sales manager at Chicago, which position he held until January 1, 1927, when he became branch manager for the Ajax Rubber Co. in New York City. He was a member of Masonic bodies, and various clubs.

Mr. Tweedy was probably the most widely known tire distributing man in the United States, with experience covering more than twenty-seven years. He was a big-hearted, fine type of man who had a multitude of friends but without a single enemy.

### Vice President of The B. F. Goodrich Co.

The sudden death of Lorenzo D. Brown, vice president of The B. F. Goodrich Co., on Saturday night, September 17, 1927, while traveling on a train between Buffalo and Rochester, New York, was a great shock to his many friends and business associates, and brought the second break in the ranks of Goodrich officials within a month. Mr. Brown motored into Cleveland Saturday where he boarded a train for New York City. He died shortly after the train left Buffalo, the cause of his death being heart disease.

Only last week he had served as one of the honorary pallbearers at the funeral of Bertram G. Work, Goodrich's president who died at St. Moritz, Switzerland, and was buried in Akron, Ohio. He had been a close personal friend of Mr. Work's and was very much affected and depressed by the news of his death.

Born at Hornell, New York, December 28, 1874, Mr. Brown's



Lorenzo D. Brown

family moved to Urbana, Ohio, where he attended grade schools. The family finally located in Akron, Ohio, and he completed his education at the high school of that city. His connection with Goodrich dated from 1916, when he was made treasurer of the company. Previous to that he had been vice president of the First Trust & Savings Bank. Two years ago he was made a vice president of The B. F. Goodrich Co., in charge of finance.

Mr. Brown was married to Anna Seymour of Hudson, Ohio, and three children were born to them—Lucien S., Robert S., and Louise, all of whom survive him. Mrs. Brown died two years ago. The funeral was held on September 20, at three o'clock at the Church of Our Savior. Interment was at Glendale, Ohio.

### Prominent Crude Rubber Man

It is with deepest regret that we chronicle the passing of Robert B. Baird, chairman of the board of directors of the Baird Rubber & Trading Co., which occurred on Friday, September 9, at his late residence, 630 Third street, Brooklyn, New York. His unusual energy and cheerful disposition won him many friends, and he was one of the most popular and successful men in the rubber industry.

Born in Sandusky, Ohio, March 24, 1858, Mr. Baird was in his 69th year, and had been in poor health since his injury in a trolley accident in 1916. He was struck by a car and badly crushed under the fender, suffering from severe shock and a slight concussion of the brain.



Robert B. Baird

Connected with the rubber trade since 1885, Mr. Baird started as cashier and bookkeeper for the New York & Boston Rubber Co., later acting as salesman for the New York Commercial Co. and George A. Alden & Co., of Boston. Leaving these firms he conducted, under his own name, a crude rubber business in Boston, acting as New England representative for Otto G. Mayer, rubber importers, and for Loewenthal & Morgenstern, rubber reclaimers, of New York. Mr. Baird was a prominent member of the old New England Rubber Club, his popularity among competing rubber men being as great as that which he enjoyed with his own associates and customers.

In 1901, he opened offices in New York City, operations being carried on under the name of the Rubber Trading Co., which name was changed in 1912 to the Baird Rubber & Trading Co. In this enterprise, Mr. Baird was joined by his brother, William T. Baird, former treasurer of the New York Belting & Packing Co., and treasurer of the Mechanical Rubber Co. The financial experience and capital which William T. Baird brought into the firm, together with the sales ability of Robert B. Baird, formed an effective combination and the company prospered from its inception.

Robert L. Baird, a son of Robert B. Baird, became identified with the company in 1907, and in 1910 Collier W. Baird, son of William T. Baird, joined the organization. William T. Baird, Jr., was admitted to the firm in 1919.

Mr. Baird is survived by his wife and one son, Robert L. Baird, who is now vice president of the Baird company, and in addition he leaves a host of friends and business associates in the crude rubber industry, where he was so long and favorably known.

Funeral services were held on Saturday, September 10, from his home in Brooklyn, with interment at Norwich, New York.

# The Rubber Industry in Europe

## Great Britain

The crude rubber outlook continues to be the main topic of discussion in rubber circles and it is to be noted that opinions of a rubber shortage within the next few years, are again to the fore, no doubt stimulated by similar views from America, notably those recently expressed by William O'Neil, president of the General Tire & Rubber Co. The shortage is predicted not only on the basis of growing consumption as against an output which for the next few years is not capable of any considerable increase, but because it seems to be expected that sooner or later the use of reclaim in tires will have to be given up altogether, or at least greatly reduced. The possibility that a cheap tire consisting largely of reclaim may eventually by its very cheapness, without regard to its durability, come to fill a demand as great and as enduring as that for the flivver, and that any shortage that may take place, will occur in spite of the continued extensive use of reclaim, never seems to enter the minds of those whose chief interest is centered in crude rubber.

### Restriction Weighed

Of course no discussion of the rubber outlook could be complete without some remarks on restriction, and so we find the same statement over and over again, that the prospects for rubber would be anything but rosy if restriction were removed now, as the market would be glutted, prices would sag, etc. But as has been noted for some time not every one is now content to accept restriction at its face value and while advocates of the scheme still pin their faith to it they are now examining its workings more closely and more or less boldly make plain the fact that while there is nothing wrong with the theory of restriction, its practice is quite another matter again.

As the *Rubber Age* of London puts it in a recent issue: "Before admitting, however, that the policy of restriction has failed, it is pertinent to ask if there has really been restriction in actual fact?" Apart from the efficiency of restriction in its application, the question comes up again and again, as to how much longer it is to continue, for it is beginning to dawn on many minds that the rubber industry of today is not what it was five years ago and within the next ten or fifteen years it will be completely revolutionized by

reason of widespread adoption of new and scientific methods of planting and exploitation. So that restriction as a permanent institution is considered neither necessary nor desirable.

### Institution of the Rubber Industry

The following program of papers has been arranged for the various sections of the I. R. I. in connection with the session 1927-1928:

#### LONDON AND DISTRICT SECTION

1927

October 12, "Coagulation, Structure and Plasticity of Crude Rubber." Dr. O. de Vries.

November 7, "Permeability of Rubber and Methods of Measuring It." H. A. Daynes, D.Sc., F.Inst.P.

December 5, "Efficiency Methods in the Rubber Industry." H. Hamill.

1928

January 2, "Synthetic Resins." A. A. Drummond, M.Sc., A.I.C.

February 6, "Automatic Controls in Rubber Manufacturing Plant." H. C. Young, M.I.Mech.E., M.I.E.E., F.I.R.I.

March 5, "Methods Used for Determining Abrasion With Particular Reference to the Relation between Road Performance and Laboratory Results." L. J. Lambourn, M.Sc., A.Inst.P., A.I.R.I.(Sc.).

April 2, Short Papers Night. "Notes on the Behavior of Prussian Blue and some other Ferro-cyanides in Rubber." J. R. Scott, D.Sc. "Stickiness of Unvulcanized Rubber." R. W. Griffiths, B.Sc., A.Inst.P., A.I.R.I.(Sc.). and Maldwyn Jones, B.Sc.

May 7, "Band Tires." T. S. Gardner.

#### SALES SECTION

1927

October 17, "What Advertising-Salesmanship Can Do for the Rubber Industry." Hopton Hadley, F.I.S.A.C., F.I.S.M.A., vice president of the Incorporated Society of Advertising Consultants, vice chairman (1925-6-7) Incorporated Sales Managers' Association of the United Kingdom.

November 21, "Standard Costing."

1928

January 16, "The Art of Window Dressing." C. Tullberg (member of the British Association of Display Men), display manager of the Gramophone Co., Ltd.

February 20, "How the R.G.A. Propaganda Assists the Rubber Industry." Sir Stanley Bois.

March 10, "Buying Methods Abroad and at Home." John Hart, member of the Council of the Incorporated Sales Managers' Association.

#### MANCHESTER AND DISTRICT SECTION

1927

September 22, Geographical Society, St. Mary's Parsonage, Manchester. Annual General Meeting, after which Mr. H. C. Young, M.I.Mech.E., M.I.E.E., F.I.R.I., will open a discussion on his paper: "Production Methods in a Rubber Factory."

October 27, Geographical Society "Transmission and Conveyor Belting." W. A. M. Keith.

November 24, Assembly Rooms, Bleachers' Association, Blackfriars street, Manchester. "Artificial Silk and its Uses in the Rubber Trade and Possible Lines of Development." Major A. B. Shearer.

December 9, Manchester Literary and Philosophical Society, 36, George street, Manchester. Joint Meeting with the Society of Dyers and Colorists. "The Coloring of Cold Cure Rubber." W. E. Sanderson, A.I.C.

1928

January 26, Geographical Society. "The Proper Use of Organic Colors in Soft and Hard Rubber." W. J. S. Naunton, M. A., M.Sc., Ph.D., F.I.C.

February 3, Hall of Society of Chemical Industry. Joint Meeting with Society of Chemical Industry. "The Effect of Zinc Oxide in the Coefficient of Vulcanization." S. A. Brazier, M.Sc., F.I.C., F.I.R.I., and L. R. Ridgway, Ph.D., A.I.C.

March 22, Geographical Society. Short Papers Night.

#### LIVERPOOL

1928

March 6, "Rubber Footwear Manufacture." R. M. Fitzpatrick, B.Sc., F.I.R.I.

#### BIRMINGHAM AND DISTRICT SECTION

1927

October 13, "India Rubber as an Auxiliary to Suspension." F. W. Lanchester, M.Inst.C.E.

November 10, "Industrial Application of Latex." P. Schidrowitz, Ph.D., F.I.R.I.

December 8, "Selling." A. E. Hemsworth, A.I.R.I.(Eng.).

1928

January 12, Short Papers Night. "Power Consumption on Calenders." J. Morrison, B.Eng. "The Variability in Plasticity of Different Types of Rubber." F. L. Elliott, F.I.C. Paper by a Member of the Northern Polytechnic.

March 8, "Rubber as a Floor Covering." J. Kirkwood, A.I.R.I.(Tech.).

#### SCOTTISH SECTION

1927

—Joint Meeting at Glasgow with Society of Chemical Industry and Institute of Chemistry.

1928

—Paper by D. F. Twiss, D.Sc., F.I.C., F.I.R.I.

### Cresson's Rubber Paving

It will be remembered that about six years ago Lionel Cresson, chief chemist, Singapore Rubber Works and Netherlands Gutta Percha Co., Singapore, invented a rubber paving block which was eventually tested on part of a roadway

subjected to heavy traffic. Now after five years, it is reported that the paving is in excellent condition yet showing hardly any signs of wear and none at all of creeping, surface slipping, skidding, while the adjoining asphalt-granite part of the road has had to be reconstructed three times during this period.

The blocks, which consist of a rubber slab attached by direct vulcanization to a basic agglomerate composed chiefly of granite chips, sand gravel, cement, etc., will be made in Singapore and shipped to London ready for laying.

### Estate Outputs

Estate outputs of 392 companies for the first nine months of the fifth restriction year, that is from November, 1926, to July, 1927, have been tabulated by the *India Rubber Journal*. From these tables it appears that 212 companies in Malaya had a total output for the nine months amounting to 47,259 tons against the average quota, 41,412 tons, for nine months, which is an average excess of 14.12 per cent over the average exportable allowance of 70 per cent. At the same time the total output of 38 Ceylon companies was 4,508 tons against quota of 4,254 tons, or an average excess of 5.97 per cent.

Comparing these results with percentages for the first ten months of 1926, it develops that the Malayan companies which at that time were 6.95 per cent short of their allowable quota, have now more than made up their shortage, while the Ceylon companies, which had been short 13.10 per cent, still have to make up their shortage. Figures of outputs of 253 Malayan companies for July, 1927, show a decrease of over 3,000,000 pounds as compared with July, 1926; the totals for 76 companies in Java and Sumatra reveal a drop of about 130,000 pounds, while for 46 Ceylon companies there is an increase of some 240,000 pounds.

### British Notes

Rubber lectures will be given in connection with the eightieth session of the Department of Commercial Products, City of London College, Moorfields, London, E. C. 2. These lectures will be delivered on consecutive Tuesday evenings, the first to begin on November 1. George Rae, of Harrisons & Crosfield, Ltd., will give ten lectures entitled "A Survey of Rubber Production and Consumption," two lectures will be by J. E. Nathan, of Francis Peek & Co., Ltd., on "The Marketing of Rubber", and four by Dr. H. P. Stevens, on "The Character, Grades and Defects of Raw Rubber." At the end of the course an examination will be held and a prize of five guineas will be awarded to the best student by the Rubber Trade Association of London and the Rubber Growers' Association, jointly.

## Germany

German exports of rubber goods during the first half of 1927 came to 81,997 quintals, value 49,579,000 marks, against 90,713 quintals, value 53,921,000 marks for the same period of the year before. The total imports were 26,596 quintals, value 16,269,000 marks in 1927, as compared with 11,713 quintals, value 6,346,000 marks in 1926. The marked decrease in exports against the even more notable increase in imports is the cause of much concern in local rubber circles. The most important change is considered the switch in the ratio of imports and exports of tires.

### German Tire Imports

As was noted above, Germany's trade in tires is showing a disturbing tendency toward the adverse side of the German trade balance. A comparison of figures for the first six months of 1925, 1926, 1927, respectively, indicates that the export surplus in this business has dropped from 18,750,000 marks in 1925 to 12,333,000 marks in 1926, to 1,800,000 in 1927. It will be seen from the table below that the export trade in tires, after mounting slightly in 1926, on the whole remained stationary.

	EXPORT OF TIRES		First Half of 1927
	1925	1926	
Inner tubes, number	109,626	99,476	89,351
Cycle tubes, number	1,498,122	1,207,480	1,532,557
Casings, number	87,449	104,309	99,146
Cycle casings, number	615,848	416,597	580,213
Solid tires, number	1,958	12,460	11,390
Total in marks	10,541,000	12,140,000	12,190,000

Against this the imports of tires show a considerable increase, the totals growing from 2,333,000 marks in 1925, to 11,900,000 marks in 1926 and to 10,350,000 marks over the first six months of 1927.

	IMPORTS OF TIRES		First Half of 1927
	1925	1926	
Inner tubes, number	8,892	62,882	110,053
Cycle tubes, number	2,253	28,375	44,418
Casings, number	14,707	111,696	149,094
Cycle covers, number	1,324	14,256	199,797
Solid tires, number	2,977	1,316	224
Total in marks	1,165,000	5,972,000	10,352,000

The growth in the imports is chiefly due to shipments from the United States and Belgium.

### German Notes

Crude rubber imports into Germany showed a considerable increase over the first half of 1927 as compared with 1926, the figures being 198,733 quintals and 94,980 quintals, respectively. This circumstance taken in connection with the fact that imports are rising while exports show a decline indicates that at

least consumption of rubber goods in Germany itself is rapidly developing.

## Holland

A glance at the figures for Holland's trade in crude and manufactured rubber during the first half of 1927, when compared with that for 1926, immediately shows that while almost every kind of tire and tube was imported in much greater numbers than in the previous year, and that crude rubber imports also were higher, there was a considerable drop in the shipments of rubber footwear entering Holland in 1927, as shown in the table below.

	IMPORTS		First Half of	
	1926	1927	1926	1927
Crude rubber, tons	1,547	2,502	4,531,000	5,018,000
Automobile tires, number	64,104	89,666	3,329,000	3,368,000
Automobile tubes, number	49,059	77,227	427,000	446,000
Motorcycle tubes, number	3,153	2,623	13,000	8,000
Motorcycle tires, number	2,762	3,568	50,000	48,000
Tires for other wheels, number	531,424	835,599	1,043,000	1,350,000
Tubes for other wheels, number	343,097	607,604	323,000	412,000
Solid tires, number	895	1,030	84,000	114,000
Footwear, pairs	884,592	587,355	799,000	557,000

### RUSSIAN RUBBER TRUST

According to the production program of 1928 the output of the Russian Rubber Trust is to exceed that of 1927 by 23 per cent. In the case of rubber footwear it is planned to raise the output from 30,600,000 pairs in 1927 to 36,500,000 pairs in 1928. At the same time costs of production are to be reduced by 10 per cent, while the efficiency is to be raised 26 per cent. The increase in the output of rubber footwear in 1926 as compared with 1925 is illustrated by the following table:

	Rubber Shoes Pairs	Pneumatic Articles Number	Total Production Rubles
1926	253,006,000	5,034,000	956,301,000
1925	157,308,000	8,945,000	738,945,000

During the first half of 1927, the Russian Rubber Trust produced 15,050,000 pairs of rubber shoes instead of 12,920,000 pairs in the same period of the preceding year. At the same time 999,032 kilos of tires against 986,867 kilos, and 2,560,000 kilos of various technical articles against 3,020,000 kilos were produced. The total result of the working for the first six months of 1927 was an increase of 8.34 per cent, which is to say that the program was fulfilled to the extent of 103.57 per cent.

# The Rubber Industry in the Far East

## Malaya

The recent burst of anti-restrictionism in which a certain section of the British press indulged has of course met with a lot of criticism here. It is considered un-British and unpatriotic, and at least one rubber producing company passed a resolution to this effect.

### Restriction Standards

As was to be expected, that staunch advocate of restriction, A. W. Still, has a few words to say on this matter too, and as usual is quite ready to support his statements with figures. To those who assert that restriction no longer serves its purpose and is without effect, he replies with the retort that at the present moment it is more necessary than ever, for without it the market would be glutted and prices would drop below a shilling. To show just how well restriction is working he points out first that standards are too high and that in his estimate the full capacity of Ceylon and Malaya would be 65,000 tons and 315,000 tons respectively, that is 380,000 tons in all. For the first half of the current restriction year then, the unrestricted export would have been 190,000 tons, but it actually was only 169,824 tons, or over 20,000 tons less than free export on fair standards. Quite true. But by his own showing the week before, the exports from the restriction areas, Ceylon and Malaya combined, during the first half of the present restriction year was 15,000 tons more than in the same period of 1925-26. And it should not be forgotten that in 1925-26 we were on an 85-100 per cent basis as against an 80-70 per cent basis this year.

### Effect of Full Production

A further interesting point not to be overlooked in an estimate of the value of restriction is that in the former year planters were unable to fill their quotas when they reached 100 per cent, with the well-known result that we have had to work off—and the job has not been completed by any means—some 40,000 tons of unused export rights. In fact, in 1925-26, with prices more favorable than now all that Ceylon and Malaya together could export was a little over 330,000 tons, which is 50,000 tons less than Mr. Still's fair standard and nearly 10,000 tons less than Malaya's present standard alone. From which we may draw the conclusion, among others, that even Mr. Still's moderate figure for standard is too high, and that

reductions calculated on the basis of fictitious standards cannot count.

### Weakness of Restriction

However, we quite agree with A. W. S. when he says: "Restriction is a powerful weapon, but the edge was taken off it when the maximum standard was first advanced from 400 to 500 pounds, and when even the latter limit was removed, and the standard of Malaya raised to nearly 340,000 tons on the top of the perpetuity given to 23,544 tons of unused coupon rights!"

The weakness of restriction is that it has never been allowed to function, which is a fact that should not be lost sight of in any calculations or considerations of the future.

### Dr. Hauser in Malaya

Dr. Hauser has returned to Europe and if an interview published in the *Straits Times* is correctly understood, he will have some very interesting findings to report on.

The eminent scientist visited Malaya primarily in connection with the Revertex process. Latex treated by this method, it may be of interest to note, is being manufactured on a commercial scale on the Merlimau Estate, Malacca. Dr. Hauser went there to give the finishing touches to the process and to insure that it was as simple and foolproof as possible. Another object was to fill up a few gaps in the knowledge gained of the physio-chemistry of rubber latex. It seems that he and his assistant, Dr. Scholtz, have been successful in this regard and will publish results in detail when they return to Europe.

### Testing Hevea Trees

From the interview we learn that Dr. Hauser has been working on a method to determine the characteristics of a Hevea plant at a very early stage, when the plant is six or seven months old instead of waiting till it is about five years old as at present.

In his experiments with rubber latex he found that among the particles contained in a small quantity there was one globule of peculiar shape. This globule in one tree differed from the globule in another tree, but when a tree was grown from seed of another tree, examination of the latex would show that the distinguishing particle of the offspring was identical with that in the latex from the parent tree, consequently from the known qualities of the

parent it would be possible to tell those of the offspring at a very early age. He has discovered what seems to be a law, but a good deal of work has still to be done in this direction.

Besides this a number of experiments have been conducted to discover the production of latex within the tree, a problem of great importance as affecting tapping systems and affecting the life and growth of the tree. These experiments also still have to be completed, but Dr. Hauser hopes that results that will greatly benefit rubber producers will eventually be attained.

### The Wilkinson Process

The Wilkinson process, as is known, utilizes fresh latex direct so as to preserve the natural properties of the rubber. The latex arrives daily from the neighboring European and native estates in motor tank wagons which are discharged by gravity into a weighing tank, from there again by gravity into a bulking tank and finally, once more by gravity into Shanghai jars for chemical treatment. When the coagulated latex is ready for machining, it is passed through very heavy and large machines and emerges as process crepe ready for drying in the adjoining drying shed. When dry, the process crepe has to submit to the working of the very largest and heaviest laminating machine in the country.

## Ceylon

According to statistics published by the Rubber Controller for Ceylon, the number of plantations in Ceylon has considerably increased since 1922. Between that year and 1926 more than 20,000 acres of land in blocks of over ten acres in extent have been planted to rubber. During the same period there was a similar increase in the area of estates under ten acres, so that in all some 40,000 acres have been added to Ceylon's rubber acreage in the four years mentioned, in spite of restriction. The standard production has been put at 73,839 tons for 1926-27, the average assessment of estates over ten acres being 338 pounds and for estates under ten acres, 360 pounds per acre.

From an official statement of the amount of rubber shipped from Ceylon in June, 1927, we learn that while the permissible amount for the month was 3,692 tons, the quantity of Ceylon grown rubber actually exported during the month was 3,596 tons. At the same time 370 tons of imported rubber were also shipped from Ceylon ports. It is furthermore of interest to note that there are still 11,895 tons in unused coupons standing to Ceylon's credit. For some reason or other the surplus is taking quite a long time to work off.

## Netherlands East Indies

A summary of the reports on the investigation of native rubber undertaken by the Native Rubber Investigation Committee and the Department of Agriculture, Industry and Commerce, has just been published. Mr. Luytjes, who is responsible for this résumé, comes to the conclusion that for the time being the only basis of calculation of the extent of the native rubber industry are the export figures, and these cannot be considered quite reliable prior to 1925 when the imposition of the 5 per cent tax on native rubber caused closer scrutiny and the keeping of more accurate records of native shipments. From 1919 to 1926 these exports, calculated for dry weight were 11,000 tons, 8,000, 5,000, 20,000, 40,000, 56,000, 85,000 and 85,000 tons respectively. The most important districts are Djambi, 16,000 tons in 1925, the two divisions of Dutch Borneo about 16,000 tons each, Palembang and East Coast of Sumatra, 11,000 tons, and Riouw, 7,000. However, the loss in washing is another uncertain factor and the writer of the report strongly urges that this should be regularly checked up.

### Export and Labor

The monthly exports show the tendency to form stocks when prices fluctuate, in fact in 1926 when the natives were prosperous and money was plentiful very slight fluctuations resulted in the formation of large reserves. The writer states that a great deal of new planting was undertaken in the last few years and that very considerable increases in output are to be looked for in 1929, 1930 and 1931. With prices in the neighborhood of one guilder per half kilo (\$0.40 per 1.1 pounds) for standard quality the labor situation will prove the sole deciding factor. However, there are indications that labor will probably not prove to be a very disturbing factor as certain new rulings regarding the free recruiting of labor from Java will also benefit the native grower, who will thereby be enabled to recruit labor without having to submit to all the formalities and conditions that up to now have proved so burdensome both to native employer and worker.

### 200,000 Tons Native Rubber!

According to Mr. Luytjes, the dry output of native rubber may in the future run up to 200,000 tons a year, a truly staggering figure. And, he says, the question of labor will not have the absolute power of limiting output that it is generally thought it would have. For, as the number of trees increase, the native owner will once more take up his own primitive method of periodical tapping whereby he will save on

cost of tapping without serious curtailing effect on his production. In fact, with his rather too intensive methods of working, a periodical system should prove all to the good as far as the health of the trees is concerned. Therefore, as the native grower has little or no overhead and his holdings are generally so small that at a pinch he could, with his periodical system, do all the necessary tapping himself with whatever help he could get from his family, he would in spite of a low price be able to exert great influence upon the market.

### Effect of Prosperity

The final remarks deal with the effects on the native of his sudden wealth gained with rubber. At first it seems that the easily gotten money went to his head and he indulged in all sorts of, to the European, rather ridiculous extravagances, but for the most part the natives have grown used to having money and are spending it sensibly—for improved houses, better food and clothing, while a good part of it has been reinvested in rubber or other enterprises. In fact, a native merchant class has developed that has proved that it is willing and able to compete with the Chinese, a development that may yet prove of the utmost importance, just as the new standards of living are bound to have an effect on their easy-going natures, that is they will have to become less easy going if they wish to go on enjoying better things.

### Sensation Mongering

Both in the local press and it seems even in England the news has been spread of a dire disease that is causing heavy damage among trees on estates in Java. A local paper told its readers that a form of senile decay or disease of old age is visiting Hevea trees in Java particularly, a disease which simply kills the trees and for which no cure has been found, and which therefore menaces the rubber industry in Java.

At the same time a subscriber of the *Planters' Chronicle* sent to this periodical a clipping from an English paper describing a mysterious disease which is affecting all rubber trees in Java above a certain height. It is further stated that the Dutch Government is taking the greatest precautions to keep this condition secret. The writer seems to feel a joy at the prospect that this disease, if it has not yet spread to the British Colonies, will prove a blessing to the British growers.

A comparison of the statements and of remarks thereon made by a Dutch expert and the Indian mycologist, Mr. Ashplant, shows that both scare articles deal with the same matter. The disease is Hevea mildew which is particularly prevalent

when the wintering period is wet. It was first noted in Java in 1918, and annually makes its reappearance. Up to a few years ago it was comparatively harmless but has of late been more serious, and is causing a certain amount of anxiety among some planters. It has also appeared in Malaya and Ceylon, but has not spread there to the extent that it has in Java. The disease attacks young foliage and is therefore rather difficult to combat, but as abnormal weather seems to be the cause, it may never become a serious menace.

## South India

Authoritative statistics covering the rubber growing industry in South India and Burma show that at the end of 1926 the total number of plantations was 1,171, covering an area of 203,654 acres, as against 1,070 plantations with a total area of 201,222 acres the year before. Extensions to existing estates reported so far accounted for 9,366 acres, but at the same time 3,307 acres of old cultivation were abandoned, so that the net increase was 6,059 acres over the total area of 132,580 acres planted to rubber in 1925. That is, in 1926 the total area under rubber was 138,639 acres or 5 per cent more than the previous year, but of this land only 101,329 acres were tapped. Of the total area under cultivation 50 per cent was in Burma, 31 per cent in Travancore, 10 per cent in Madras, 6 per cent in Cochin, 2 per cent in Coorg and 1 per cent in Mysore.

The total production of raw rubber during the year came to 23,004,167 pounds (Hevea, 22,813,285 pounds, Ceara, 35,134 pounds, Ficus elastica, 155,748 pounds) as against 19,970,188 pounds (Hevea, 19,747,931 pounds, Ceara, 61,274 pounds, and Ficus elastica, 160,983 pounds) a year ago.

The yield per acre of tapped area was 234 (228) pounds in Cochin; 233 (226) pounds in Travancore; 230 (208) pounds in Burma; 216 (202) pounds in Madras; 157 (156) pounds in Coorg and 41 (37) pounds in Mysore. The figures in brackets are for 1925. There was an increase in total production in Burma and Travancore.

The daily average number of persons employed in the plantations during 1926 was given as 48,383, of which 42,574 were permanently employed and 5,809 temporarily as against 41,964, 35,103 permanent and 6,861 temporary, in 1925.

The total stock of dry rubber held on December 31, 1926, was estimated at 3,760,593 pounds, mostly Hevea rubber as compared with 4,308,773 pounds on the corresponding date of the preceding year.

The exports of rubber by sea were 3 per cent above those for the year before, the United Kingdom taking 45 per cent, Straits Settlements 23 per cent, Ceylon 21 per cent and America about 10 per cent of the total exports. Burma accounted for nearly 51 and Madras for 49 per cent.

# Rubber Patents, Trade Marks and Designs

## United States

August 9, 1927\*

- 1,638,206 Leggings. Thomas Kelly, Butte, Montana.  
1,638,304 Combined Hose Supporter and Shirt Adjuster. Charles George Gay, Victoria, British Columbia, Canada.  
1,638,370 Cushion Tire. William J. Small, Port Townsend, Washington, assignor of one half to Lucien E. Becker, Portland, Oregon.  
1,638,460 Tire Flap. George J. Bosworth and Samson Hodge Smith, Cumberland, Maryland.  
1,638,485 Musical Instrument Mechanism. Adolph P. Gustafson, Chicago, Illinois.  
1,638,504 Insole. Charles A. Morin, Boston, Massachusetts.  
1,638,701 Cushioned Heel. Harry G. Norwood, assignor by mesne assignments to Balloon Rubber Heel Co., Inc., both of Baltimore, Maryland.

August 16, 1927\*

- 1,638,817 Submarine Craft. Harry N. Atwood, Monson, assignor to Rubwood, Inc., Lawrence, both in Massachusetts.  
1,638,842 Multiple Arch Sling. Ellwyn De L. George, Canon City, Colorado.  
1,638,947 Universal Joint. Alfred F. Masury and August H. Lelpert, assignors to International Motor Co., all of New York, N. Y.  
1,638,983 Tire Deflation Indicator. Francis G. Crone, Buffalo, New York.  
1,639,073 Stirrup Pad. Henry F. Berbaum, Chicago, Illinois.  
1,639,079 Oil Well Plug. William C. Cushing, Bristow, Oklahoma.  
1,639,108 Rim Fastener. Alden L. Putnam, Detroit, assignor by mesne assignments of one half to Motor Wheel Corp., Lansing, both in Michigan, and one half to The Midland Steel Products Co., Cleveland, Ohio.  
1,639,175 Cushion Tire. George Gatil, assignor of one half to Steve Matlasko, both of Tarentum, Pennsylvania.  
1,639,207 Wheel Tire. John Agrillo and Joseph Daly, San Jose, California.  
1,639,381 Pneumatic Sole. George Manelas, Harrisburg, Pennsylvania.  
1,639,433 Detachable Heel. Francis Alexander Hutchison, Wimbledon Park, England.  
1,639,452 Storage Battery Container. Carl J. Dunsweiler, assignor to Willard Storage Battery Co., both of Cleveland, Ohio.  
1,639,753 Vehicle Wheel. André Jules Michellin, Paris, assignor to Michellin et Cie, Clermont-Ferrand, both in France.  
1,639,807 Water Sport Apparatus. Beulah Louise Henry, assignor of one half to Edwin A. Guinzburg, both of New York, N. Y.  
1,639,836 Antirattler Spring Shackle. Henry E. Blomgren, assignor to Rubber Shackle Co., Inc., both of Brooklyn, New York.

August 23, 1927\*

- 1,639,940 Vehicle Tire. Daniel Lar Gavia, Mexico, Mexico.  
1,639,998 Tire Valve Base. Albert Ennis Henderson, Toronto, Ontario, Canada.  
1,640,014 Vaginal Balloon. Cesare Tomasulo, New York, N. Y.  
1,640,182 Feeding Bottle Teat and Valve. William Conrad Ingram and Ernest James Everest, Hackney Wick, London, England.  
1,640,216 Wringer Roll. John J. Bathers, assignor to Lovell Manufacturing Co., both of Erie, Pennsylvania.  
1,640,270 Aviator's Suit. William Russell Furman, Troy Mills, Iowa.  
1,640,302 Shoe Attachment. Charles Van Tassel, Los Angeles, California.

August 30, 1927\*

- 1,640,354 Heel. John B. Hadaway, Swampscott, Massachusetts, assignor to United Shoe Machinery Corp., Paterson, New Jersey.  
1,640,403 Inner Tube Boot. Benjamin V. Gilmore, Gauley Bridge, West Virginia.  
1,640,414 Hand Stamp. Fred L. Lake, Dallas, Texas.  
1,640,460 Paving Block. August H. Lelpert, College Point, assignor to International Motor Co., New York, both in New York.

\*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

- 1,640,481 Closure for Tubes. Frederic C. Collins, Akron, Ohio.  
1,640,618 Pneumatic Mattress. Robert W. Sampson, assignor to Sampson Martin Corp., both of New York, N. Y.  
1,640,686 Heel. Harry N. Atwood, Monson, assignor to Rubwood, Inc., Lawrence, both in Massachusetts.  
1,640,689 Hose Supporter Clasp. Jennie M. Bodensiek, New York, N. Y.  
1,640,788 Vibration Dampener. Alfred F. Masury, assignor to International Motor Co., both of New York, N. Y.  
1,640,823 Brassiere. Katherine E. Cunningham, assignor to The H. W. Gossard Co., both of Chicago, Illinois.  
1,640,844 Pneumatic Tire. Frank Le Roi Main, Birmingham, assignor to General Motors Corp., Detroit, both in Michigan.  
1,640,863 Dust Cap. James Elmore Turrell, Noxen, and William G. Thomas, West Pittston, both in Pennsylvania.  
1,640,924 Window Cleaner. John H. Cook, Salt Lake City, Utah.  
1,641,029 Mat. Ernest Gaudet, Hyde Park, Massachusetts.

September 6, 1927\*

- 1,641,150 Cushion Tire. William A. Brubaker, Akron, Ohio.  
1,641,204 Clothes Wringer. William P. Shattuck, Minneapolis, Minnesota.  
1,641,225 Bumper. Wilfred G. Johnson, Elyria, Ohio.  
1,641,311 Cover for Steering Wheels. Alfred George Barrett and Hubert Henry Burton, Leicester, England.  
1,641,316 Milking Cup. Otto Bruun, Frederiksberg, near Copenhagen, Denmark.  
1,641,352 Play Ball Valve. Hugo Goldsmith, assignor to The P. Goldsmith Sons Co., both of Cincinnati, Ohio.  
1,641,457 Tire Inflating Means. Charles Romer, Newark, New Jersey.  
1,641,511 Penholder. George Truman Swasey, Raymond, Washington.  
1,641,535 Overshoe. Joaquin de Noronha, Dusseldorf, Germany.  
1,641,594 Water Bottle Stopper. Henry Phillip Kraft, Ridgewood, New Jersey; Edgar J. Phillips and Earl A. Darr, executors of said Henry Phillip Kraft, deceased.  
1,641,607 Toy Airplane. Karl C. Spatz, Little Rock, Arkansas.  
1,641,625 Sandal. Miriam L. Davis, assignor of nine-twentieths to J. H. Berry, both of Portland, Oregon.  
1,641,663 Vehicle Wheel. Charles J. Dalton, New York, N. Y.  
1,641,777 Roll Grizzly. Ray C. Newhouse, Wauwatosa, assignor to Allis Chalmers Manufacturing Co., Milwaukee, both in Wisconsin.  
1,641,780 Extractor. Harry J. Parker, assignor of one fourth to Karl Tritschler, both of San Francisco, California.  
1,641,782 Pneumatic Tire. Lester E. Trotter, Augusta, Kansas.  
1,641,826 Heel. Antonio Pentifallo, Hollidaysburg, Pennsylvania.  
1,641,836 Rubber Bed. Lyman P. Armstrong, San Jose, California.

## Dominion of Canada

August 9, 1927

- 272,959 Candy Mold. Hugh McAllister, Wishaw, Lanarkshire, Scotland.  
272,993 Skate Protector. Archibald Whitley, Edmonton, Alberta.  
273,075 Teat Cup. William Reginald Cockburn, Otahuhu, and Albert Hickton O'Leary, assignee of one half interest, both in Auckland, New Zealand.  
273,082 Parasite Spreading Device. The Achille Giacomo Calabi, assignee of Giuseppe Furmanik, both of Rome, Italy.

August 16, 1927

- 273,171 Hearing Apparatus. Anton von Suchorzynski, Breslau, Germany.

August 23, 1927

- 273,264 Swimming Sleeve. George Evans, Redondo Beach, California, U. S. A.  
273,344 Metal Wheel. Michellin et Cie (Société en Commandite par Actions), Clermont-Ferrand, Puy-de-Dôme, assignee of André Jules Michellin, Clermont-Ferrand, both in France.

August 30, 1927

- 273,391 Cushion Tire. Thomas J. Benson, Melcher, Iowa, U. S. A.

September 6, 1927

- 273,688 Glass Cleaning Applicator. The Gold Dust Corp., New York, N. Y., assignee of Lloyd H. Barbach, Chicago, Illinois, both in U. S. A.  
273,698 Winding Bobbin. The Manhattan Rubber Manufacturing Co., Passaic, assignee of Harry V. N. Snyder, Clifton, both in New Jersey, U. S. A.  
273,740 Tube and Case Protector. George Frederick Mohman and Edward Patrick McDonald, assignee of half the interest, both of Edmonton, Alberta.

## United Kingdom

July 27, 1927

- 271,954 Waist Belt. R. M. B. Smith, Silver-side, Bearsden, near Glasgow, Scotland.  
272,046 Vehicle Wheel. H. E. Hughes, Toy Hall, Cheshunt, Hertfordshire.  
272,120 Boot. C. Rudl, 45 Grosvenor Square, Rathmines, Co. Dublin, Ireland.  
272,154† Freezing Apparatus. M. Buhre, 1 Goethestrasse, Hamburg, Germany.  
272,164 Parachute. A. G. Calabi, 15 Via in Lucina, Rome.

August 4, 1927

- 272,282 Wheel Tire. Michellin et Cie and E. E. Michellin, 12 Cours Sablon, both in Clermont-Ferrand, Puy-de-Dôme, France.  
272,287 Douche Nozzle. A. Barth, 37 Schellingstrasse, Munich, Germany.  
272,327 Paving Block. C. D. Rotch, The Elms, Park Road, Teddington, Middlesex, and A. L. G. Warren, 17 Chatsworth Road, West Norwood, London.  
272,329 Foot Arch Support. S. C. M. Knipe, Moleside Croft, Brockham, Betchworth, Surrey.  
272,332 Surgical Syringe. W. W. Groves, 30 Southampton Buildings, London. (Cook Laboratories, Inc., 536 Lake Shore Drive, Chicago, Illinois, U. S. A.)  
272,338 Pipe Coupling. W. M. Billington, 2 Central Buildings, Westminster.  
272,368 Centrifugal Extractor. H. J. Parker, 1677 Sacramento Street, San Francisco, California, U. S. A.  
272,434† Warning Horn. J. Montilla Y Caballero de Oropeza, 17 Paseo de los Tilos, Malaga, Spain.  
272,554† Printing Machine Employing Rubber Plate. Deutsche Roneo Ges., 32 Kochstrasse, Berlin, Germany.

August 10, 1927

- 272,592 Hot Water Bottle. E. Brewin, Fowey, Silverlea Gardens, Horley, Surrey.  
272,625 Galvanic Battery. G. Reinström, 80 Lübeckstrasse, Wandsbek, near Hamburg, Germany.  
272,635 Surgical Douche. B. Feldmann, 97 Eisenacherstrasse, Berlin, Germany.  
272,643 Hot Water Bottle Socket. A. Miller, Kremure Works, Bishopbriggs, near Glasgow, Scotland.  
272,719 Motorcycle Foot Rest. Powell & Hammer, Ltd., and F. Hammer, Chester street, Birmingham.  
272,730 Conductor. Callender's Cable & Construction Co., Ltd., and T. Petersen, Hamilton House, Victoria Embankment, London.  
272,769 Swimming Sleeve. G. Evans, Hotel Clifton, Redondo Beach, California, U. S. A.  
272,778 Luggage Carrier. T. Bielefeld, 93 Bahnhofstrasse, Schleswig, Germany.  
272,785 Vehicle Brakes. B. Norton, Sanford Hall, Claverley near Wolverhampton.  
272,791 Collapsible Boat. L. Mellersh-Jackson, 28 Southampton Buildings, London. (Airsips, Inc., Hammondsport, New York, U. S. A.)  
272,802 Tire. G. B. Ellis, 70 Chancery Lane, London. (Goodyear Tire & Rubber Co., 1144 East Market street, Akron, Ohio, U. S. A.)  
272,806 Harness. J. Wiesenfeld, 7 South Howard street, Baltimore, Maryland, U. S. A.  
272,934† Valve. G. Demarch, 127 Rue Elise, Brussels, Belgium.

Chemical patents will be found on page 20. Machinery and process patents will be found on pages 24-25.

August 17, 1927

- 273,994 Number Plate. A. Bowley, 32 Union street, Ardwick, Manchester.
- 273,999 Hide Splitting Machine Bed. Turner Tanning Machinery Co., Ltd., and G. A. Schettler, Railway Foundry, Bramley, near Leeds.
- 273,010 Book Cover. H. B. Stone, P. H. Jones and C. H. S. Cox, 22 Charles street, Hatton Garden, London.
- 273,034 Filling Machine. J. A. Roberts and United Alkali Co., Ltd., Cunard Building, Liverpool.
- 273,041 Vehicle Cushion. G. Bennie, Normanhurst, Craigmare, Bute.
- 273,078 Knee Pad. H. Galloway, 3 Wensley Drive, Chapel Allerton, Leeds, and J. M. Gibson, 15 Craggwood Terrace, Hoxforth, near Leeds.
- 273,151 Reservoir Pen. J. Shure, San Souci, Connaught Avenue, Chingford, London.
- 273,161 Tooth Protector for Boxers. T. Hilge, 22 Schloss-Strasse, Coblenz, Germany.
- 273,170 Bucket. L. G. Burt, 325 East 4th street, Tulsa, Oklahoma, U. S. A.
- 273,178 Skates. H. Plauson, 51 Hagedornstrasse, Hamburg, Germany.
- 273,194 Trouser Brace. E. B. Betham, 7 Woodside, Erskine Hill, London.
- 273,239 Condenser. Dubilier Condenser Co. (1925) Ltd., Ducon Works, Victoria Road, North Acton, London. (Assignees of A. Nyman, 4377 Bronx Boulevard, New York, N. Y., U. S. A.)

August 24, 1927

- 273,313 Stopper. H. Sturm, 9411 Billstrasse, Hamburg, Germany.
- 273,348 Water Softener. H. J. Magrath, 10 Dixon Road, New Cross, London.
- 273,357 Reservoir Pen. L. Gunsberg, 3 Broxholm Road, West Norwood, London, and E. Faldorf, 28 Onslow avenue, Richmond, Surrey.
- 273,358 Battery Box. A. Fraser, Factory Lane, Croydon, Surrey.
- 273,367 Bearing. E. W. Johnson, 3 Spencer Mansions, Queen's Club Gardens, London, and C. Defries, The Lodge, Western Lawns, Hove, Sussex.
- 273,423 Dental Impression Tray. T. E. Malins, 81 Herne Hill, London.
- 273,435 Brace. W. A. Middlebrook, 8 Westbourne Road, Horwasa, Yorkshire.
- 273,448 Brick Making Machine. C. Whittaker & Co., and N. Whittaker, Downy street, Ironworks, Accrington, Lancashire.
- 273,453 Grip Device for Handle. G. N. Philips, Lakenham, Kingsmead avenue, Worcester Park, Surrey.
- 273,456 Window Regulator. Rawlings Manufacturing Co., Ltd., 1 Larch Road, Balham, and H. T. Plummer, 19 Drakefield Road, Upper Tooting, both in London.
- 273,463 Packing Box. G. Spencer, Moulton & Co., Ltd., and C. W. C. Hine, 2 Central Buildings, Westminster.
- 273,491 Cap. S. Ash, Templar Street Works, Leeds.
- 273,511 Glove. W. Sykes, Ltd., and W. O. Sykes, Yorkshire Athletic Goods Manufacturing, Westfield Road, Horbury, Yorkshire.
- 273,513 Baby Carriage Tire. W. Lines, Triangles, Works, Morden Road, Merton, London.
- 273,517 Fish Press. D. H. Bookless, of Bookless Brothers (Aberdeen), Ltd., Albert Quay, Aberdeen.
- 273,533 Cable. Callender's Cable & Construction Co., Ltd., T. Petersen and V. T. Burchall, Hamilton House, Victoria Embankment, London.
- 273,540 Preventing Windows Rattling. A. E. Miller, Queensmount, Helensburgh, Dumbartonshire.
- 273,553 Cable. Callender's Cable & Construction Co., Ltd., Hamilton House, Victoria Embankment, London, and J. Bowyer, Anchor Works, Leigh, Lancashire.
- 273,567 Horseshoe. H. T. P. Clements, 114 Wyndham Crescent, Canton, and R. P. Rees, 35 Partridge Road, both in Cardiff.
- 273,573 Motorcycle Saddle. A. Bernhard, 110 Rheinländerstrasse, Mannheim, Germany.
- 273,579 Garter. W. H. and C. A. Reddall, Trivett's Buildings, Short Hill and T. F. Fellden, 31 Hampden street, both in Nottingham.
- 273,583 Umbrella Ring. H. Loose, 18 Marshgate Lane, Stratford, London.
- 273,624 Draft Excluder. W. Quick, 68 Boileau Road, North Ealing, London, S. E. Thomas, Tregarth, Bath Road, Cranford, Hounslow, Middlesex, and F. W. Berwick, 63 Drenstead Road, Streatham Hill, London.

† Not yet accepted.

- 273,627 Detachable Sole and Heel. H. Asher, 59 Fleetwood Road, Dollis Hill, London.
- 273,679 Abrasive Article. Carborundum Co., Ltd., Trafford Park Road, Trafford Park, Manchester. (Assignees of M. L. Hartmann, Longue, California, U. S. A.)
- 273,700 Tire. Michelin et Cie., Clermont-Ferrand, Puy-de-Dome, France.

## New Zealand

June 30, 1927

- 57,486 Milk Testing Appliance. George Sutherland Thomson, 31 Tooley street, London, England.

July 14, 1927

- 56,802 Cable. Pirelli and Co., of Biocca Works, assignees of Luigi Emanuel, both of Milan, Italy.

## Austria

- A 2682 Tire. Dr. F. Ringer, Dr. E. Sachse, Vienna; Dr. M. Grotter, Prague; and A. Schindler, Zwickau.
- A 5639 Gaiter. Neue Gummigamaschen-Gesellschaft m. b. H., Berlin.

## Germany

- 447,960 Football Bladder Valve. Prosper Eugene Anglade, Marselles, France. Represented by F. Neubauer, Berlin, W. 9.
- 448,058 Shaving Brush. Hillel Zimmet, Grosse Allee 1, Hamburg.
- 448,725 Injection Syringe. Cook Laboratories Inc., Chicago, Illinois U. S. A. Represented by K. Hallbauer and A. Bohr, Berlin S. W. 61.
- 448,806 Occlusive Passary. Dr. August Fleischer, Kaiserallee 31a, Berlin Wilmersdorf. (Addition to patent No. 444,367.)

## France

- 630,139 Semi-Pneumatic Tire. C. G. Soutif.
- 632,828 Inner Tube. Societe d'Exploitation des Roues Dag.
- 632,896 Marine Rubber. C. A. Houques-Fourcade.
- 633,059 Improvements in Pneumatic Tires. Lambert Tire and Rubber Co.
- 633,700 Tire with Multiple Pneumatic Elements. A. M. Sevaux.
- 634,408 Protective Leather for Pneumatic Tires. J. Chounet.
- 634,635 Rubber Provided with Hollows Thereby Increasing Its Flexibility. F. Wassner.
- 634,789 Rubber Tube. R. Kaesmacher.

## Trade Marks

## United States

## Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

August 9, 1927, Act of February 20, 1905

- 230,885 Sonny-Shoe—boots and shoes of leather, fabric, rubber, etc. W. Y. Miller, Schuykill Haven, Pennsylvania.
- 230,967 Vestoff—suspenders. Hewes & Potter, assignor to Hewes & Potter, Inc., both of Boston, Massachusetts.
- 230,970 Representation of a store in the front of which stands a large crowd, at the top of the representation the words: "True To Its Name," and "Mark-Off"—boots and slippers, shoes of leather, fabric, rubber, etc., rubbers. Markoff Bros., doing business as Mark-Off Shoe Stores, Danbury and South Norwalk, Connecticut, and Peekskill, New York.
- 230,975 "Sea Shell"—bathing shoes. I. B. Kleinert Rubber Co., New York, N. Y.
- 231,035 Oval containing the representation of a harp and the words: "Exclusive Foreign

Fabrics," and "Tipperary Twist"—outer clothing, including raincoats, sport suits, etc. Heidelberg, Wolf & Co., New York, N. Y.

231,070 Fancy oval containing the words "Aux Capucines"—boots, shoes, moccasins, sandals and bath slippers of leather, rubber, fabric, etc. Chausures Bally Société Anonyme de Fabrication, Schoenenwerd, Switzerland.

August 9, 1927, Act of March 19, 1920

- 231,106 Selborne—boots and shoes made of leather, rubber, fabric, etc. Simon Collier, Ltd., Northampton, England.

August 16, 1927, Act of February 20, 1905

- 231,160 Representation of an elephant and a ringmaster, between the two figures the word: "Jumbo"—chewing gum. American Chicle Co., Long Island City, New York.
- 231,165 "Ansonet"—wide elastic webbing. The Ansonia O. & C. Co., Ansonia, Connecticut.
- 231,178 "Chu-tabs"—medicated chewing gum. John Lecroy & Son, Camden, New Jersey.
- 231,190 "Onanoff"—boots, shoes and overshoes. Cambridge Rubber Co., Cambridge, Massachusetts.
- 231,219 "Norman"—inner tubes and tires. The Gates Rubber Co., Denver, Colorado.
- 231,230 "Pathfinder"—belting. The Goodyear Tire & Rubber Co., Akron, Ohio.
- 231,246 "Shuglov"—boots, shoes and overshoes. The Miller Rubber Co., Akron, Ohio.
- 231,281 "Penco"—soles and heels. J. C. Penney Co., Wilmington, Delaware, and New York, N. Y.
- 231,296 "Tirefit"—inner tubes for vehicular tires. Lee Rubber & Tire Corp., Conshohocken, Pennsylvania.
- 231,420 "Bond Cord"—tire casings. Sterling Tire Corp., Rutherford, New Jersey.

August 23, 1927, Act of February 20, 1905

- 231,623 "Carbo-Hide"—sooling materials. Jacob C. Schachet, Denver, Colorado.
- 231,755 "Vulcan"—golf balls. Robert Smith, doing business as Bob Smith, Boston, Massachusetts.

August 23, 1927, Act of March 19, 1920

- 231,792 "Tom Roger"—garters, garment supporters, etc. Meyer Segal, Philadelphia, Pennsylvania.

August 30, 1927, Act of February 20, 1905

- 231,879 "Posner-Pedic"—shoes of leather, rubber, fabrics, etc. Dr. A. Posner Shoes, Inc., New York, N. Y.
- 231,916 "Waffle"—shoe soles. Aron Sole Co., Avon, Massachusetts.
- 232,021 "Welfleet"—boots, shoes and overshoes. Hood Rubber Co., Watertown, Massachusetts.
- 232,069 Diamond containing the words: "Red-shin." Quaker City Rubber Co., and "Philadelphia." Pa. U. S. A.—belting. Quaker City Rubber Co., Wissinoming and Philadelphia, Pennsylvania.

September 6, 1927, Act of February 20, 1905

- 232,148 "Young Moderns"—shoes of leather, rubber, fabrics, etc. Marshall Field & Co., Chicago, Illinois.
- 232,197 "Bally"—boots, shoes, sandals, moccasins and bath slippers of leather, rubber, fabrics, etc. Chausures Bally Société Anonyme de Fabrication, Schoenenwerd, Switzerland.
- 232,227 "Duplex"—rubber bands, pencils and pen holders. American Lead Pencil Co., New York, N. Y.
- 232,238 The words: "Dorothy Dodd" and "Pedic"—boots, shoes and slippers of leather, rubber, felt, silk, cloth, etc. Dorothy Dodd Shoe Co., Boston, Massachusetts.
- 232,240 "Millinaire"—shoes, slippers and boots of leather, rubber, fabric, etc.; overshoes, spats, etc. I. Miller & Sons, Inc., Long Island City, New York.
- 232,304 "La Verne"—hostery and shoes of leather, rubber, etc. The Famous, Braddock, Pennsylvania.
- 232,345 Three spaced concentric colored stripes or bands disposed centrally of and extending circumferentially around the sidewall portion of a tire casing and placed symmetrically on opposite sides thereof as indicated by the line shading in the drawing, which denotes the colors blue, gold, and blue respectively—pneumatic vehicle tires. The Goodyear Tire & Rubber Co., Akron, Ohio.
- 232,346 The word: "Welds-It" in fancy formation—adhesive compound for repairing rubber goods. Welds-It Manufacturing Co., Philadelphia, Pennsylvania.
- 232,364 Fancy oval containing the words: "The Taylor Made Shoe"—boots, shoes and slippers of leather, rubber and textile material. E. E. Taylor Co., Boston, Massachusetts.
- 232,374 "Ees Arch"—shoes of leather, fabric, rubber, etc. J. P. Smith Shoe Co., Chicago, Illinois.
- 232,449 "Man-O-War"—pneumatic tires and inner tubes. Belknap Hardware & Manufacturing Co., Louisville, Kentucky.

- 232,480 "Flying Ebony"—pneumatic tires and inner tubes. Beiknap Hardware & Manufacturing Co., Louisville, Kentucky.
- 232,488 "Venticoat"—rubberized and waterproof raincoats and overcoats. Samuel H. Freedman, doing business as The Standard Raincoat Co., Boston, Massachusetts.

September 6, 1927, Act of March 19, 1920

- 232,483 Shoulderbrill—tires. Lee Rubber & Tire Corp., Conshohocken, Pennsylvania.
- 232,490 Oblong containing the words: "R-Tis-Tik Footwear"—leather, fabric and rubber shoes.
- B. Friedman Shoe Co., Inc., New York, N. Y.
- 232,492 "Firestone"—footwear. Firestone Footwear Co., Hudson, Massachusetts.

## Dominion of Canada

Registered

August 16, 1927

- 41,929 Large circle of chains, enclosing a series of circles representing a chain arranged in the form of a cross—surgical dressings. Johnson & Johnson, Ltd., Montreal, Quebec.
- 41,938 Name: "Euna Jettick"—boots, shoes and slippers of leather, rubber, fabric, etc. Dunn & McCarthy, Inc., Auburn, New York, U. S. A.
- 41,959 Word: "Lo-N-Hi"—footwear, etc. Canadian Goodrich Co., Ltd., Kitchener, Ontario.
- 41,964 Word: "Reddole"—canvas and rubber lined canvas hose. F. Reddaway & Co., Ltd., Victoria Mills, Cheltenham street, Pendleton, Manchester, County of Lancaster.

August 23, 1927

- 42,015 Word: "Truili"—golf balls. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario.

August 30, 1927

- 42,057 Words: "Court Special"—footwear. The Northern Rubber Co., Ltd., Guelph, Ontario.
- 42,058 Words: "Court Special" and the representation of a shoe with a colored strip on the toe cap and a colored patch on the counter—sport shoes and boots. The Northern Rubber Co., Ltd., Guelph, Ontario.
- 42,088 Word: "Handy-Andy"—tire and tube repair kits and tire patching materials. The Miller Rubber Co., Akron, Ohio, U. S. A.

## United Kingdom

July 27, 1927

- B476,340 Luxor—knicker elastic webs. Jones, Stroud & Co., Ltd., Austin's Factory, Market Place, Long Eaton, Derbyshire.
- 479,550 Macinco—all goods included in Class 40. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.
- 481,332 Representation of a leaf—all goods included in Class 40, but not including rubber heels, tips and tires and not including any goods of a like kind to any kind of these excluded goods. S. Redfern & Co., Ltd., Sainter Works, Charles street, Princess street, Manchester.
- 481,473 Maclop—all goods included in Class 40. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.
- 481,475 Mac-Lop—all goods included in Class 40. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.
- 481,476 Macinlop—all goods included in Class 38. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.
- 481,477 Macinlop—all goods included in Class 40. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.

August 3, 1927

- B481,152 Britto—machine belting. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate and Irwell Works, Ordall Lane, both in Salford.

August 17, 1927

- 481,506 Renovcord—tires. The Modern Tyre Re-Rubbing Co., Ltd., 5, Great Ormond street, London, W. C. 1.
- 481,591 Delatop—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
- 481,593 Bathaway—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
- 481,593 Playaway—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
- 481,769 Dryaway—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
- 482,238 Nomet—rubber covered electric wire. W. T. Henley's Telegraph Works Co., Ltd., 11, Holborn Viaduct, London, E. C. 1.

August 24, 1927

- 480,024 Fancy design containing the words: "The Star"—all goods included in Class 40, but not including tires or any goods of a like kind to tires. Vereinigte Gummiwaren-Fabriken Wimpasing Vormalis Meiner-J. N. Reithoffer, Wimpasing IM, Schwarzaale, Lower Austria (Abel & Imray, 30, Southampton Buildings, London, W. C. 2).
- 482,636 Python—hose. The Beldam Packing & Rubber Co., Ltd., 16, Gracechurch street, London, E. C. 3.
- 482,637 Anaconda—hose. The Beldam Packing & Rubber Co., Ltd., 16, Gracechurch street, London, E. C. 3.
- 482,638 Viper—hose. The Beldam Packing & Rubber Co., Ltd., 16, Gracechurch street, London, E. C. 3.
- 482,639 Scarab—hose. The Beldam Packing & Rubber Co., Ltd., 16, Gracechurch street, London, E. C. 3.

August 31, 1927

- 481,472 Maclop—waterproofed clothing. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.
- 481,474 Mac-Lop—waterproofed clothing. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.

## Designs United States

- 73,254 Tire. Term 14 years. William C. Garriques, assignor to The Williams Foundry & Machine Co., both of Akron, Ohio.
- 73,255 Tire. Term 14 years. William C. Garriques, assignor to The Williams Foundry & Machine Co., both of Akron, Ohio.
- 73,289 Tire. Term 14 years. William C. Hoover, assignor to The Norwalk Tire & Rubber Co., both of Norwalk, Connecticut.
- 73,401 Hydrometer Suction Bulb or the Like. Term 14 years. Leo Edelmann, assignor to E. Edelmann & Co., both of Chicago, Illinois.

## Dominion of Canada

- 7,647 Tire tread. Gutta Percha & Rubber, Ltd., Toronto, Ontario.
- 7,648 Tire tread. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

## Germany

- 997,029 Rubber Floor Covering. Thüringer Schlauchweberei, und Gummiwerk, Walter-shausen I. Thuringia.
- 997,099 Rubber Mail with Iron Insert. Hermann Loos and Georg Schmidt, Okristel a. Main.
- 997,377 Device for Testing Hardness of Vulcanized Rubber. Dunlop Rubber Co., Ltd., London. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfurt a. Main, and T. R. Koehnborn and E. Noll, Berlin S. W. 68.
- 997,550 Garter. Maximilian Rost, G. m. b. H., Bodenbach, a. d. Elbe, Czecho-Slovakia. Represented by H. Zechel, Alsenstrasse 32, Berlin-Wannsee.
- 997,552 Heel Patch. Otto Ashauer, Arolsen, Waldeck.
- 997,642 Mouth Piece for Pipes or Cigar Holders. Wilhelm Fried, Vienna, Austria. Represented by Dr. S. Lustig, Breslau 1.
- 998,015 Suction Cup for Attaching Glass Rods to Towel Holders. Carl Kramer, Werming-sen b. Iserlohn 1. W.
- 998,044 Cover for Children's Hats and Caps. Franz Th. Otto & Co., Hildeshelmerstrasse, 205, Hanover.
- 998,493 Rubber Bladder with Voice for Toys. Bernhard Heumann, Sonnenberg 1. Th.
- 998,601 Inflatable Figure. Sachsland Gummi-warenfabrik, Buzgel 1. Th.
- 998,697 Removable Foot for Stand. Josef Klotz, Ravensburg, Württemberg.
- 998,926 Pacifier for Children. F. Schutze & Co., Ltd., London. Represented by E. Wolf, Berlin S. 42.
- 999,036 Tire and Means of Attaching It. The Dunlop Rubber Co., Ltd., London. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfurt a. Main and T. R. Koehnborn and E. Noll, Berlin S. W. 11.
- 999,235 Massaging Apparatus. Gottfried Ribbe, Eisenstrasse 66, Dresden.

## Prints

### United States

- 10,117 Your Legs Will Thank You! Your Waist Will Thank You! Your Shoulders Will Thank You! Garters, belts and suspenders. Pioneer Suspender Co., Philadelphia, Pennsylvania. Published February 26, 1927.
- 10,153 U. S. Certified Canvas Shower Curtain. Shower bath curtain. Para Rubber Co., Newark, New Jersey. Published July 1, 1927.

### SOLAR SECTIONAL TIRE

The distinctive features of the so-called Sun Section tire here illustrated are (1) a separate shoe for each section, (2) a separate bladder or tube for each section, and (3) a separate rim for each section. The individual sections, of which 12 compose a complete tire, are so clamped to the wheel rim as to prevent their circumferential or lateral movement and to exclude dust entering between the sections, or allow them to chafe each other. A few of the many advantages claimed for this tire construction are reduced cost of manufacture and loss by seconds; elimination of dangers from blowouts, punctures and rim-cuts; carrying of spare sections only



Des Rosiers Tire

instead of spare whole tires; saving of time in making tire repairs on the road; complete reduction of the friction caused by internal air pressure, and the reduction of skidding to a minimum. The tire is provided with a master valve and connecting flexible pipe to allow air to be pumped simultaneously into each individual section and permit an equalization of the pressure in every section.—Des Rosiers Patents Co., Inc., Providence, Rhode Island.

COMMERCE REPORTS SHOWS A GOOD market in Mexico for American made gabardines. Large numbers of this type of coat are imported from France, Germany and England, while rubberized raincoats, the majority of which are worn by the army, are produced locally.

## Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
1,000	Machines for manufacturing molded bathing caps.
1,001	Manufacturer of Thermlo.
1,002	Firms manufacturing vulcanized fiber.
1,003	Machinery for making rubber plasters.
1,004	Manufacturers of cloth insertion spliced gaskets.
1,005	Foreign inquiry for manufacturers of toys, balls, bathing specialties and footwear.
1,006	Dealers in scrap rubber.
1,007	Solution used in steel molds to prevent sticking.
1,008	Manufacturers of one-quarter inch cotton cord in 50 pound reels.
1,009	Address of a manufacturer of rubber swimming gloves.

## TIRE INVENTORY — PRODUCTION — DOMESTIC SHIPMENTS

A decline is noted in inventory, production and shipments of tires and tubes during July, figures showing a slowing up on all classes with the exception of shipments of inner tubes which reached a total of 5,302,546 against June's figures of 5,124,246. Shipments of pneumatic casings and all types of inner tubes were heavier in July, 1926, than for the corresponding month in 1927; inventory and production of pneumatic casings gained, while inventory and production of inner tubes showed a decline during the same periods.

Totals for July, 1927, inventory, production and shipment of pneumatic casings are 8,494,900, 3,815,624 and 4,480,193; June's figures being 9,346,923, 4,659,195 and 4,690,393 respectively. July inventory for inner tubes was 12,003,664 showing a decline from June's figures of 13,393,897; production for July was 3,963,737 against June's total of 4,729,830; while shipments rose from a total for June of 5,124,246 to 5,302,546 for July.

Consumption of cotton fabric for casings, tubes, solid and cushion tires for July was 4,010,262 pounds, and crude rubber consumption for the same products was 41,208,924 pounds.

	July, 1927		
	Inventory*	Production	Shipments
Pneumatic casings—all types.....	8,494,900	3,815,624	4,480,193
Inner tubes—all types.....	12,003,664	3,963,737	5,302,546
Balloon casings.....	4,465,684	2,195,215	2,181,168
Balloon inner tubes.....	6,139,588	1,931,454	2,161,532
High pressure cord casings.....	3,694,710	1,600,389	2,146,846
High pressure inner tubes.....	5,864,076	2,032,283	3,141,014
Solid and cushion tires.....	177,379	47,701	47,135

COTTON AND CRUDE RUBBER CONSUMPTION IN TIRES AND TUBES	
	Pounds
Cotton fabric.....	4,010,262
Crude rubber.....	41,208,924

\*As of July 31, 1927.

Rubber Association figures representing 75 per cent of the industry.

## FIRST NATIONAL FUELS MEETING

Under the auspices of the Fuels Division of The American Society of Mechanical Engineers, the First National Fuels Meeting will be held in St. Louis, Missouri, October 10 to 13, 1927. There will be papers of a general nature of interest to all users of fuel; papers on fuels in industrial furnaces; papers of interest to the central station man; and smoke abatement papers of interest to everyone.

JULY IMPORTS OF GOLF BALLS INTO THE UNITED STATES numbered 370,710, value \$165,759, according to the Department of Commerce. The total number imported in the first seven months of 1927 was 1,961,681 as compared to 2,194,345 in the same period of 1926.

## Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NUMBER	COMMODITY	CITY AND COUNTRY	PURCHASE OR AGENCY
26,900	Baby aprons, pants, etc.	Sydney, Australia.....	Agency
26,925	Tires and tubes.....	Victoria, Brazil.....	Both
26,926	Automobile and motorcycle tires.....	Vienna, Austria.....	Agency
26,940	Packings.....	Vienna, Austria.....	Agency
26,963	Second hand and worn out inner tubes.....	Vigo, Spain.....	Purchase
26,964	Belts, overshoes and baby pants, bibs, aprons and toys.....	Beirut, Syria.....	Both
26,965	Fan belts and automobile inner tubes.....	Santa Domingo, D. R. ....	Agency
26,966	Druggists' rubber sundries	Frague, Czechoslovakia..	Agency
26,967	Beaded edge automobile tires in small sizes.....	Frague, Czechoslovakia..	Agency
26,968	Balata and rubber belting	Copenhagen, Denmark....	Agency
26,996	Rubber toys.....	Bangalore, City, India....	Agency
27,020	Rubber flooring.....	Frague, Czechoslovakia..	Agency
27,033	Automobile tires.....	Berne, Switzerland.....	Agency
27,048	Bathing shoes and caps...	Copenhagen, Denmark....	Agency
27,051	Rubber toys, best quality.	Zurich, Switzerland....	Either
27,056	Rubber products.....	Tel-Aviv, Palestine.....	Agency
27,057	Low priced automobile tires and rubber toys.....	Cairo, Egypt.....	Agency
27,094	Boots and shoes, hygienic rubber articles, sponges, caps, elastic stockings, air cushions, and aprons	Dresden, Germany.....	Agency
27,159	Boots and overshoes, water bottles, and rubber soles	Milan, Italy.....	Both
27,160	Rubber tiling.....	Helsingfors, Finland....	Purchase
27,161	Rubber shoes especially tennis shoes with crepe soles.....	Hamburg, Germany....	Both
27,162	Waist belts and druggists' rubber sundries.....	Alexandria, Egypt.....	Agency
27,203	Automobile tires.....	Bucharest, Rumania.....	Agency
27,204	Automobile tires.....	Sao Paulo, Brazil.....	Agency
27,227	Sporting and athletic goods	Casablanca, Morocco....	Both

## Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

NUMBER	SPECIAL CIRCULAR
1610....	Crude Rubber News Letter.
1611....	Tire Exporters' Weekly News Letter.
1612....	Rubber Invoiced to the United States During the Week Ended August 23, 1927.
1613....	Mechanical Rubber Goods Exporters' Monthly News Letter.
1614....	July Imports of Golf Balls into the United States.
1615....	July Imports of Rubber Tires into the United States.
1616....	Crude Rubber Receipts From the United States, Month of July, 1927.
1617....	Tire Exporters' Weekly News Letter.
1618....	Rubber Invoiced to the United States During the Week Ended August 27, 1927.
1619....	Crude Rubber News Letter.
1620....	Market for Casings in Australia.
1621....	Tire Exporters' Weekly News Letter.
1622....	Rubber Footwear Exporters' Monthly News Letter.
1623....	Crude Rubber News Letter.
1624....	Brazil Tire Market.
1625....	Rubber Invoiced to the United States During the Week Ended September 3, 1927.
1626....	British Exports of Rubber Footwear During July, 1927.
1627....	British Exports of Automobile Casings During July, 1927.
1628....	Preliminary Statistics of United States Crude Rubber Imports, August, 1927.
1629....	Tire Exporters' Weekly News Letter.
1630....	Crude Rubber News Letter.
1631....	Rubber Invoiced to the United States During the Week Ended September 10, 1927.

## Imports of Crude Rubber Into the United States by Customs Districts

	*July, 1927		Seven Months Ended *July, 1927	
	Pounds	Value	Pounds	Value
Massachusetts.....	5,727,750	\$2,119,874	31,881,488	\$11,802,126
St. Lawrence.....	.....	.....	6,864	2,265
Buffalo.....	.....	.....	23,948	9,024
New York.....	73,898,425	27,759,143	512,539,916	190,041,075
Philadelphia.....	1,656,967	627,998	3,352,516	1,201,279
Maryland.....	1,878,209	697,099	13,524,367	5,017,975
New Orleans.....	.....	.....	2,057	227
Los Angeles.....	725,324	276,859	14,514,115	5,334,253
San Francisco.....	69,346	22,937	3,240,740	1,253,792
Oregon.....	66,200	25,927	648,819	252,881
Washington.....	.....	.....	112,000	44,240
Dakota.....	.....	.....	28	10
Michigan.....	.....	.....	910	325
Chicago.....	.....	.....	500	128
Ohio.....	262,849	113,240	3,087,630	1,105,215
Colorado.....	112,000	35,182	884,800	326,332
Totals.....	84,397,110	\$31,678,259	583,820,698	\$216,391,147

\* Including latex, dry rubber content.

## Statistics Compiled from Questionnaire<sup>1</sup> Covering the Second Quarter of 1927

	Long Tons			
	Inventory at End of Quarter	Production	Shipments	Consumption
RECLAIMED RUBBER				
Reclaimers solely (5).....	3,082	15,859	15,839	1
Manufacturers who also reclaim (24).....	10,364	25,338	8,914	18,950
Other manufacturers (67).....	5,841	.....	.....	15,774
Totals .....	19,287	41,197	24,653	34,725

	Long Tons		
	Inventory at End of Quarter	Consumption of Manufacture Reclaimed	Due on Contract at End of Quarter
SCRAP RUBBER			
Reclaimers solely (5).....	37,862	27,064	8,886
Manufacturers who also reclaim (20).....	20,154	24,995	11,870
Other manufacturers (15).....	315	.....	.....
Totals .....	58,331	52,059	20,756

### Number of Tons of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products

PRODUCTS	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tire and Tire Sundries:		
Automobile and motor truck pneumatic casings.....	62,825	\$169,695,000
Automobile and motor truck pneumatic tubes.....	13,792	25,208,000
Motorcycle tires (casings and tubes).....	97	534,000
Bicycle tires (single tubes, casings and tubes).....	172	608,000
All other pneumatic casings and tubes not elsewhere specified.....	6	126,000
Solid and cushion tires.....	4,327	9,841,000
All other solid tires.....	105	318,000
Tire sundries and repair materials.....	1,324	5,618,000
Totals .....	82,648	\$211,948,000

PRODUCTS	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Other Rubber Products:		
Mechanical rubber goods.....	4,003	\$25,247,000
Boots and shoes.....	3,758	17,209,000
Insulated wire and insulating compounds.....	773	8,925,000
Druggists' sundries, medical, surgical and stationers' rubber goods.....	468	3,369,000
Waterproof cloth and clothing (except rubber sheeting).....	932	6,173,000
Hard rubber goods.....	222	1,641,000
Heels and soles.....	854	4,611,000
Rubber flooring.....	252	1,271,000
Miscellaneous, not included in any of the above items.....	1,073	5,578,000
Totals .....	12,335	\$74,024,000
Grand totals—all products.....	94,983	\$285,972,000

### Inventory of Crude Rubber in the United States and Afloat for United States Ports

	Long Tons		
	Plantation	Para	All Other
ON HAND			
Manufacturers.....	67,329	2,332	2,115
Importers and dealers.....	10,744	1,877	414
Totals on hand.....	78,073	4,209	2,529
AFLOAT			
Manufacturers.....	14,336	.....	.....
Importers and dealers.....	30,512	221	100
Totals afloat.....	44,848	221	100

<sup>1</sup>Number of rubber manufacturers that reported data was 178; crude rubber importers and dealers, 41; reclaimers (solely), 5; total daily average number of employees on basis of third week of April, 1927, was 154,096.

It is estimated that the crude rubber consumption figures are \*92 per cent of the total, and the crude rubber inventory 95 per cent of the total for the entire industry.

\* Based on survey made by the Department of Commerce for the first six months of 1925.

### Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of July, 1927

	Landed for July		Delivered for July		Stocked July 31		
	Tons	Tons	Tons	Tons	1927	1926	1925
LONDON							
Plantation.....	9,504	9,785	63,528	27,504	4,058	.....	.....
Other grades.....	95	101	122	172	*21	.....	.....
LIVERPOOL							
Plantation.....	1567	493	13,059	11,190	1270	.....	.....
Total tons, London and Liverpool.....	10,266	10,379	66,709	28,866	4,349	.....	.....

† Official returns from the six recognized public warehouses.

\* Corrected by inspection.

## United Kingdom Rubber Statistics

	Imports		Seven Months Ended July, 1927	
	July, 1927			
UNMANUFACTURED				
Crude Rubber				
From—	Pounds	Value	Pounds	Value
Straits Settlements.....	11,796,800	£855,433	81,020,100	£6,487,087
Federated Malay States.....	4,762,200	343,201	39,053,800	3,119,856
British India.....	1,389,700	106,401	8,551,200	689,938
Ceylon and Dependencies.....	2,635,200	192,706	22,626,800	1,803,200
Other Dutch possessions in Indian Seas.....	1,753,200	126,461	14,984,100	1,203,820
Dutch East Indies (except other Dutch possessions in Indian Seas).....	2,533,100	184,138	19,467,900	1,573,285
Other countries in East Indies and Pacific not elsewhere specified.....	382,200	25,851	1,649,700	129,206
Brazil.....	277,600	17,736	6,778,700	432,010
Peru.....	3,500	177	30,800	1,879
South and Central America (except Brazil and Peru).....	18,800	1,345	142,400	10,457
West Africa:				
French West Africa.....	600	34	120,400	6,693
Gold Coast.....	51,300	3,091	351,300	24,946
Other parts of West Africa.....	126,400	7,712	909,600	69,073
East Africa, including Madagascar.....	166,600	13,496	848,300	66,170
Other countries.....	161,900	11,112	1,049,600	78,527
Totals .....	26,059,100	£1,888,894	197,584,700	£15,696,147
Waste and reclaimed rubber	396,200	6,186	4,137,100	65,572
Gutta percha and balata.....	223,400	17,611	3,183,600	284,865
Rubber substitutes.....	8,200	346	94,500	3,938
Totals .....	26,686,900	£1,913,037	204,999,900	£16,050,522
MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers.....	.....	£133,494	.....	£2,063,684
Inner tubes.....	.....	16,408	.....	256,421
Solid tires.....	.....	7,147	.....	122,227
Boots and shoes, doz. pairs.....	32,053	63,308	273,306	444,459
Other rubber manufactures.....	.....	141,473	.....	1,006,741
Totals .....	.....	£361,830	.....	£3,893,532
Exports				
UNMANUFACTURED				
Waste and reclaimed rubber	2,477,500	£24,087	16,241,300	£163,830
Rubber substitutes.....	71,300	1,763	401,000	9,437
Totals .....	2,548,800	£25,850	16,642,300	£173,267
MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers.....	.....	£236,994	.....	£1,859,176
Inner tubes.....	.....	48,219	.....	392,990
Solid tires.....	.....	22,216	.....	216,311
Boots and shoes, doz. pairs.....	21,688	35,831	134,790	210,356
Other rubber manufactures.....	.....	226,069	.....	1,680,568
Totals .....	.....	£569,329	.....	£4,359,401

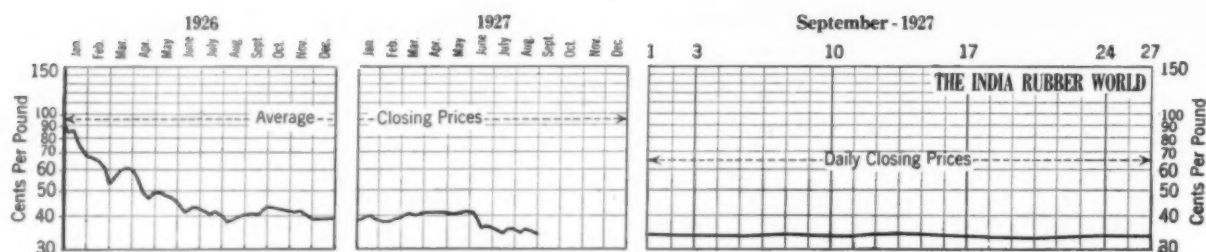
### Exports—Colonial and Foreign

	July, 1927		Seven Months Ended July, 1927	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber				
To—				
Russia.....	929,300	£78,696	16,295,400	£1,523,882
Sweden, Norway and Denmark.....	227,100	20,621	1,309,200	120,565
Germany.....	2,813,600	231,941	17,575,000	1,429,126
Belgium.....	464,900	37,170	3,482,200	270,392
France.....	2,301,900	174,858	12,773,100	1,027,334
Spain.....	79,700	6,313	634,300	50,155
Italy.....	1,575,100	116,448	6,973,400	582,113
Other European countries.....	254,500	24,992	1,969,300	182,210
United States.....	14,868,200	1,139,717	44,011,200	3,486,719
Canada.....	.....	.....	35,800	3,327
Other countries.....	45,800	3,785	457,800	42,269
Totals .....	23,560,100	£1,834,541	105,516,700	£8,718,092
Waste and reclaimed rubber	83,000	2,672	245,600	6,955
Gutta percha and balata.....	30,600	3,124	383,600	37,164
Rubber substitutes.....	7,800	324	16,500	721
Totals .....	23,681,500	£1,840,661	106,162,400	£8,762,932
MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers.....	.....	£9,407	.....	£297,732
Inner tubes.....	.....	1,885	.....	41,977
Solid tires.....	.....	295	.....	7,865
Boots and shoes, doz. pairs.....	749	1,832	8,585	19,406
Other rubber manufactures.....	.....	10,967	.....	61,340
Totals .....	.....	£24,386	.....	£428,320

\* On and after April 12, 1927, tires and tubes imported or exported with and forming part of complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

† Motor cars, motorcycles, parts and accessories, liable to duty from September 29, 1915, until August 1, 1924, inclusive, and on and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

‡ Included all tires and tubes prior to April 12, 1927.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

## Review of the Crude Rubber Market

### New York Outside Market

THE month just past in the crude market differed from the few preceding months only in being duller, if that were possible. The spot price of ribbed smoked sheets on September 2 was 34 cents buyers, 34½ cents sellers. By September 10 it had declined to 33½ cents buyers, 33¾ cents sellers. The price fluctuated fractionally higher the next week but closed on September 17 at the level of 33½ cents buyers, 33¾ cents sellers. During the next week the downward tendency continued and on September 24 ribs were 33½ cents buyers, 33¾ cents sellers. On September 26 the prices were the same.

The premium on first latex for the first three weeks was ¼ cent over ribs. This difference vanished during the week ended September 24. The consuming demand of the month was measured only by hand-to-mouth needs of the factories. They are engaged in a watchful waiting process and in no wise fear a rise in prices, feeling assured against this by reason of the stocks on hand, abroad and in the United States, and the safeguard found in the strong trading organization familiarly known as "the pool." The trade is simply marking time until the Colonial Office in London announces its decision with regard to the application of the restriction act for the quarter beginning November 1. There is some speculation as to the details of the decision but confidence is placed in the statement made several weeks ago by Mr. Amery, the Colonial Secretary, who said in Parliament: "If any change in the scheme were to become necessary, I should certainly endeavor to give as long a notice as possible."

In any event stocks are ample and the estimates of the crude rubber consumption of 400,000 to 410,000 for 1927, emanating from England are likely to prove far beyond the probabilities. American estimates indicate that rubber consumption in the United States will be nearer to 385,000 tons for 1927.

The week of September 3 ended with two holidays. In the four active business days remaining the market continued very dull with very little factory business in evidence. The easiness of the London market and lower cables worked prices down slightly in New York. Also the advices predicting August shipments of rubber at 32,000 tons had a depressing effect and indicated lower prices.

The week terminating September 10 witnessed a slow and steady decline ranging from ¼ to ¾ cents below the prevailing prices of the preceding week. Factories displayed no special buying interest

although picking up odd lots at intervals. They had no apparent interest in futures, although it is believed that considerable January-March rubber has yet to be purchased.

The market of the week ended September 17 was rather quiet with occasional factory inquiries for spot in small quantities. At the close of the week support from the trade fell off still further and rubber in the open market and on the Rubber Exchange was very weak on Saturday, with outlook for lower prices.

The week ended September 24 exhibited no relief from the dullness that characterized the preceding weeks. Prices ranged close to the lowest of the year. The arrivals in September have been rather light but with London stocks increasing, buyers are not afraid of the market.

Paras are still quiet and buyers are interested in some grades only at lower than market levels. Balata is dull but an improvement in prices is indicated.

Importations of all grades in August were 33,068 tons, compared with 25,969 tons one year ago. Plantation arrivals for August were 31,195 tons, compared with 24,431 tons one year ago. Total importations of plantation rubber for eight months ended August 31, were 280,363 tons compared with 254,945 tons for the corresponding period of 1926. Total importations of all grades of rubber for the eight months ended August 31 were 298,585 tons, compared with 271,693 tons for the corresponding period of 1926.

### RUBBER AFLOAT TO THE UNITED STATES

Week Ended	British Malaya	Ceylon	East Indies	London and Liverpool	Totals
August 27 .....	4,121	760	2,069	167	7,057
September 3 .....	4,443	734	1,058	150	6,385
September 10 .....	3,415	889	1,085	65	5,454
September 17 .....	3,832	576	1,243	162	5,813
September 24 .....	4,497	839	1,391	181	6,908

### London

The market during September was quiet. Prices generally eased off during the month. Spot ribs closed dull at 16½ pence on September 1 and had declined to 15½ pence on September 24. There were, however, brief periods when business on spot and futures was transacted in good volume.

The British rubber growing interests assert that the restriction scheme failed because it was too lenient and they will urge for its tightening when it comes up for revision on October 1. Far seeing business men who condemn the plan on the ground that it alienated

### New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

PLANTATIONS Sheet	August, 1927										September, 1927														
	22	23	24	25	26	27	29	30	31	1	2	*3	†5	6	7	8	9	10	12	13	14	15	16	17	
Ribbed smoked .....	35½	35	34½	34½	34½	34½	34½	34½	34½	34	33½	.....	.....	33½	33½	34	33½	33½	33½	34	34½	34	33½	33½	
Crepe .....	35½	35	35	34½	34½	34½	34½	34½	34½	34½	34	.....	.....	34	34	34	33½	33½	33½	34½	34½	34½	33½	33½	
First latex .....	31½	31½	31½	31½	30½	31	30½	30½	30½	30½	30½	.....	.....	30	30	29½	29	28½	28½	28½	29½	28½	28½	28½	
No. 2 blanket .....	31½	31½	30½	30½	30½	30½	30½	30½	30½	29½	29½	.....	.....	29½	29½	28½	28½	28½	27½	27½	28½	28½	27½	27½	
No. 3 blanket .....	30½	30½	30½	29½	29½	30	29½	29½	29½	29½	29½	.....	.....	29½	29½	28½	28½	28½	27½	27½	28½	28½	27½	27½	
No. 4 blanket .....	31½	31½	31	30½	30½	30½	30½	30½	30½	30½	30½	.....	.....	30	29½	29½	29	28½	28½	28½	28½	28½	28½	28½	
Thin clean brown .....	28½	28½	28	27½	27½	27½	27½	27½	27½	27	26½	.....	.....	26½	26½	26½	26½	26	26½	26½	26½	26½	25½	25½	
Roller brown .....	34½	34½	34½	33½	33½	33½	.....	.....	.....	.....	.....	.....	.....	33½	33½	33½	33½	33½	33½	33½	33½	33½	33½	33½	
Off latex .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

\* No market. † Holiday.

American consuming interests and gave Dutch producers their opportunity to increase their production to the disadvantage of the British rubber growers, urge the abolition to the plan. Unused coupons carried over from one quarter to another result in uncertainty because when the market shows a tendency to rise it is suddenly flooded by rubber exported under the unused coupons. The Federated Malay States and Straits Settlements Restriction committee intends to recommend to the Government to amend the method of using coupons and that standard production be reassessed on a proved production basis whereas it is now in excess of capacity.

London stocks increased 2,711 tons between August 20 and September 24. The weekly record is as follows: August 29, 64,842 tons; September 3, 65,162 tons; September 10, 66,148 tons; September 17, 66,664 tons; September 24, 67,550 tons.

### Singapore

The market during September was generally quiet and steady in sympathy with the conditions prevailing in London and New York. On September 24 the price of ribs for October delivery was 16 pence and firmer.

### Plantation Rubber Exports from Malaya\*

January 1 to July 31, 1927

	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom.....	5,339.33	7,004.75	5,219.70
British Possessions .....	2,341.92	55.60	46.77
Continent of Europe.....	7,443.62	1,178.40	1,770.47
United States .....	94,818.36	17,082.24	7,217.23
Japan .....	6,612.08	1,617.50	1,508.20
Other Countries .....	53.90	.....	.....
Totals .....	116,609.21	26,938.49	15,762.37

\* Excluding all foreign transshipment.

### Ceylon Rubber Exports from Jan. 1 to July 6, 1927

	Tons
To United Kingdom.....	7,612.29
Continent .....	1,254.63
Australia .....	692.74
America .....	18,475.14
Egypt .....	5.00
Africa .....	48.89
India .....	14.54
Japan .....	92.09
Total .....	28,195.32
For the same period last year.....	26,995.38

### ANNUAL EXPORTS, 1921-1926

	Tons
For the year 1926.....	58,799.56
1925.....	45,697.19
1924.....	37,351.13
1923.....	37,111.88
1922.....	47,367.14
1921.....	40,210.31

### Low and High New York Spot Prices

	1927*	1926	1925
PLANTATIONS			
First latex crepe.....	\$0.33 @ \$0.35 1/4	\$0.40 1/4 @ \$0.43 1/4	\$0.80 @ \$0.96
Smoked sheet, ribbed .....	.33 @ .35 1/4	.40 @ .43	.79 @ .95
PARAS			
Upriver, fine .....	.28 1/4 @ .30 1/2	.38 @ .40	.68 @ .75
Upriver, coarse .....	.19 @ .20	.26 1/2 @ .30	.45 @ .49 1/2
Islands, fine.....	.26 @ .27	.35 1/4 @ .37 1/2	.60 @ .68
Cameta .....	.....	.36 @ .40	.....

\*Figured to September 24, 1927.

### New York Outside Market—Spot Closing Rubber Prices—Cents, Per Pound

	19	20	21	22	23	24
PLANTATIONS						
Sheet .....	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4
Ribbed smoked .....	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4
Crepe .....	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4	33 1/4
First latex .....	27 1/4	27 1/4	27 1/4	28 1/4	28 1/4	29
No. 2 blanket.....	27 1/4	27 1/4	27 1/4	28 1/4	28 1/4	29 1/4
No. 3 blanket.....	26 1/4	26 1/4	26 1/4	27 1/4	27 1/4	27 1/4
Thin clean brown.....	27 1/4	27 1/4	27 1/4	28 1/4	28 1/4	28 1/4
Roller brown .....	25 1/4	25 1/4	25 1/4	25 1/4	25 1/4	25 1/4
Off latex .....	32 1/4	32 1/4	32 1/4	32 1/4	33 1/4	33 1/4

### New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and September 26, the current date:

	September 25, 1926	August 25, 1927	September 26, 1927
<b>Plantation Hevea</b>			
Rubber latex (Hevea).....gal.	\$1.75 @	\$1.50 @	\$1.50 @
<b>CREPE</b>			
First latex, spot.....	.42 1/4 @ .42 1/4	.35 1/4 @ .35 1/4	.34 @
September .....	.42 1/4 @ .42 1/4	.35 1/4 @	.34 @
October-December .....	.43 @	.35 1/4 @	.34 1/4 @
January-March .....	.43 1/4 @ .44	.36 @ .36 1/4	.34 1/4 @ .34 1/4
April-June .....	.44 @ .45	.36 1/4 @	.35 @
Off latex, spot.....	.41 1/4 @ .41 1/4	.34 1/4 @	.33 1/4 @ .33 1/4
Amber No. 2, spot.....	.41 @	.31 @	.28 1/2 @ .29
September .....	.41 @	.31 1/4 @	.29 @
October-December .....	.41 @	.32 1/4 @	.29 1/4 @
January-March .....	.41 1/4 @	.33 @	.29 3/4 @
April-June .....	.41 1/4 @	.30 1/4 @ .30 1/4	.30 1/4 @
Amber No. 3, spot.....	.40 @ .40 1/4	.30 1/4 @ .30 1/4	.28 @ .28 1/2
Brown, thin, clean.....	.39 1/4 @ .40 1/4	.30 1/4 @ .31	.28 @ .28 1/2
Brown, specky .....	.39 1/4 @ .40	.30 1/4 @	.28 @
Brown, roll .....	.36 1/4 @ .37	.28 @ .28 1/4	.25 @
Sole crepe .....	.70 @	.....	.58 @

### Sheet

Ribbed, smoked, spot.....	.42 @ .42 1/4	.34 1/4 @ .35	.33 1/4 @ .34
September .....	.43 @	.34 1/4 @	.33 1/4 @ .34
October-December .....	.42 1/4 @ .43	.35 1/4 @ .35 1/4	.33 1/4 @
January-March .....	.43 1/4 @ .44	.36 @	.34 1/4 @ .34 1/4
April-June .....	.44 @ .44 1/4	.36 1/4 @	.35 1/4 @

### East Indian

<b>PONTIANAK</b>			
Banjermassin .....	.17 1/4 @	.07 @	.09 @
Pressed block.....	.27 1/4 @	.14 @	.14 @
Sarawak .....	.17 1/4 @	.07 @	.....

### South American

<b>PARAS</b>			
Upriver, fine .....	.38 @	.30 1/4 @	.27 1/4 @
Upriver, fine .....	.34 @	.26 @	.27 1/4 @
Upriver, medium .....	.34 @	.26 @	.27 1/4 @
Upriver, coarse .....	.29 @	.20 @	.20 @
Upriver, coarse .....	.42 @	.32 @	.29 @
Islands, fine .....	.34 @	.28 @	.24 1/4 @
Islands, fine .....	.32 @	.28 @	.27 @
Acre, Bolivian, fine.....	.39 @	.31 @	.28 @
Acre, Bolivian, fine.....	.34 @	.24 @	.28 @
Beni, Bolivian .....	.39 1/4 @	.31 @	.28 1/4 @
Madeira, fine .....	.39 @	.30 1/4 @	.27 1/4 @
Peruvian, fine .....	.38 @	.30 1/4 @	.....
Tapajos, fine .....	.37 @	.29 @	.....

### CAUCHO

Upper Caucho ball.....	.....	.20 1/2 @	.20 1/4 @
Upper Caucho ball.....	.....	.32 @	.29 @
Lower Caucho ball.....	.....	.18 1/2 @	.19 1/4 @

### Maniobas

Ceará negro heads.....	\$.35 @	.22 @	.22 @
Ceará scrap .....	\$.18 @	.12 @	.12 @
Manioba, 30% guaranteed..	\$.34 @	.21 @	.22 @
Mangabiera, thin sheet.....	\$.38 @	.21 @	.22 @

### Centrals

Central scrap .....	.28 @	.20 @ .21	.19 1/4 @
Central wet sheet.....	.22 @	.14 @ .16	.15 @
Corinto scrap .....	.28 @	.20 @ .21	.19 1/4 @
Esmeralda sausage .....	.28 @	.20 @ .21	.19 1/4 @

### Guayule

Duro, washed and dried.....	.32 1/4 @	.29 @	.28 1/4 @
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### Gutta Percha

Gutta Siak .....	.33 @	.23 @	.21 @
Gutta Soh .....	.30 1/4 @	.....	.....
Red Macassar .....	2.80 @	3.00 @	3.50 @

### Balata

Riock, Ciudad Bolivar.....	.48 @ .50	.37 @	.40 @
Colombia .....	.42 @	.37 @	.41 @
Manaos block .....	.....	.41 @	.44 @
Panama .....	.42 @	.37 @	.41 @
Surinam, sheet .....	.76 @	.57 @	.57 @
Surinam, sheet .....	.81 @	.60 @	.61 @

### Chicle

Honduras .....	\$.65 @	\$.67 @	\$.65 @
Yucatan, fine .....	\$.65 @	\$.67 @	\$.65 @

\*Washed and dried crepe. Shipment from Brazil.  
†Nominal. ‡Duty paid.

### AMAZON VALLEY SHIPMENTS

Exports from the Amazon Valley (Para, Manaus, and Iquitos) of crude rubber have been estimated for the past few years by the Department of Commerce as follows: 1924, 23,165 long tons; 1925, 25,298; and 1926, 24,298 tons. Totals for the first five months of 1927 include 12,975 tons as compared with 9,840 for the corresponding five months of 1926.

## The Rubber Exchange of New York, Inc.

Transactions on the Rubber Exchange between August 25 and September 24, inclusive, amounted to 12,653 contracts, equivalent to 31,625 tons, compared with 8,843½ contracts or 22,106¼ tons handled in the corresponding preceding period. The high and low fluctuations of the market were moderate, the spread not exceeding one cent or less. The operations week by week showed considerable activity among traders only, factory interest being conspicuous by its absence.

During the week terminated September 3, the market was in a hesitating mood with prices gradually receding to a new low level on September 2 of 33.9 cents offered and 33.8 cents bid for spot ribs, the easier position being due to liquidation of nearby positions. The stocks of rubber in London showed a decrease of 583 tons for that week. On September 10 the week closed with very little change in prices of rubber. The tendency favored easier prices. Many rumors were afloat concerning what the British Government may do regarding restriction. One report said that the Stevenson plan would be abandoned while another said that restriction would be tightened, thus materially reducing the shipments in the quarter, beginning November 1. The result of these rumors was a quiet market with limited trading. This tendency would only be natural in view of the present statistical position of rubber. The market of the week ended September 17 showed somewhat more activity although prices showed only minor changes from those of the week before. London stocks were increased 500 tons during the week.

The week from September 19 to 24 closed with a steadier tone following a period of weakness due to uncertainty on the part of market operators. Spot rubber prices moved up on the 19th from 33.3 cents offered, 33.2 cents bid to 33.5 cents bid, offered nominal. London stocks increased 516 tons for the week.

Regarding the market situation on September 22, Paul Elbogen & Co., Inc., states that:

"No upward move can be expected until more definite news is available regarding any possible change in the Stevenson restriction plan. Should the restriction plan remain unchanged our opinion is that rubber will work higher during the last month of this year and the early part of next year. Consumption throughout the

world is increasing and if the British are to confine their output to but 60 per cent of the possible production, a certain amount of tightness in rubber will be in evidence from time to time during the first three or four months of next year."

Regarding restriction, the latest story from London reports that the efforts to have the rubber producers take over the restriction plan themselves have failed. It is also reported that the proceedings at the Economic Conference at Geneva next month will largely influence the British Government's decision with regard to the rubber restriction law. The cables state that the preponderance of opinion is that there will be a continuation of the enactment.

Should restriction be removed there will be a potential supply of 700,000 tons of rubber for next year. Even with a possible consumption of 650,000 tons, there would be an increase in the world stocks that would hardly justify the present level of prices.

Should restriction continue or be abandoned only on long notice, the world stocks must decrease and a considerably stronger market will be almost inevitable.

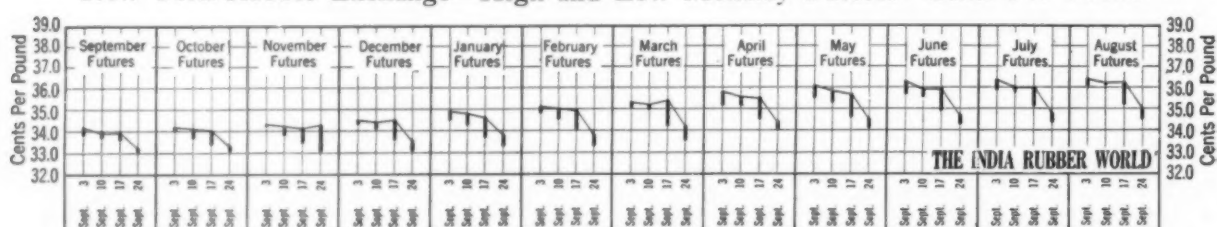
Walter Dutton, secretary of the Rubber Exchange of New York, announced September 2 that the following nominating committee had been appointed by the Board of Governors to name candidates for all offices to be filled at the annual election on October 18: Alfred Croft, chairman; Marshall Geer, Louis V. Keeler, Charles H. Moore and James R. Shannon.

L. W. Dumont, of L. W. Dumont & Co., has purchased two memberships in the Rubber Exchange of New York held by Albert L. Funke and Sylvan M. Barnet. The purchase price in both instances was \$4,500. Daniel E. Wade, of Wade Bros. & Co., has purchased the membership of John J. Pfieger, for another, for \$4,600.

Four foreign firms and one New York firm have been added to the list of copartnerships having members on the Rubber Exchange of New York: Alexander Eccles & Co., J. D. Little, Liverpool, England; Societe Anonyme Dupasquier & Co., Pierre Dupasquier, Havre, France; Fabre, Lovenbach & Co., Robert Zunz, Havre, France; Paul Etlin, Paris, France; Wrenn Bros. & Co., Marshall Geer, New York.

Announcement was also made of the admission to membership of P. V. L. Bouton, of Henderson Bros. & Co., Inc., New York, N. Y. A. C. Spencer-Hess, Inc., of which A. C. Spencer-Hess is president, has been added to the list granted corporation privileges under section 90 of the by-laws.

### New York Rubber Exchange—High and Low Monthly Futures—Cents Per Pound



### The Rubber Exchange of New York, Inc.

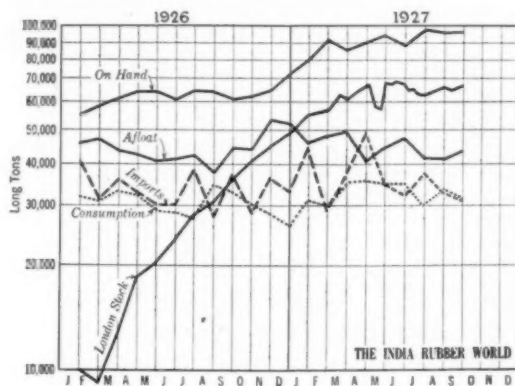
#### Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

	August						September																				
	25	26	27	29	30	31	1	2	3	5*	6	7	8	9	10	12	13	14	15	16	17	19	20	21	22	23	24
1927																											
August	34.0																										
September	34.2	34.3	34.1	33.9	34.2	33.9	33.9	33.8	...	...	33.8	33.8	33.9	33.7	33.7	33.6	33.9	33.9	33.9	33.6	33.6	33.2	33.1	33.2	33.1	33.2	33.5
October	34.3	34.5	34.4	34.2	34.2	34.0	34.0	34.0	...	...	34.0	34.1	34.0	33.7	33.8	33.7	33.9	34.0	33.9	33.6	33.4	33.2	33.1	33.1	33.2	33.3	33.5
November	34.5	34.7	34.6	34.3	34.3	34.3	34.2	34.2	...	...	34.2	34.2	33.9	33.8	33.9	33.8	34.1	34.1	34.0	33.7	33.5	33.2	33.1	33.1	33.2	33.4	33.7
December	34.7	34.8	34.8	34.4	34.5	34.5	34.3	34.3	...	...	34.4	3.4	34.3	34.1	34.1	34.1	34.4	34.5	34.3	33.9	33.6	33.2	33.2	33.1	33.3	33.6	33.9
1928																											
January	35.0	35.1	35.1	34.9	34.8	34.8	34.6	34.5	...	...	34.6	3.8	34.6	34.4	34.3	34.3	34.7	34.6	34.6	34.1	33.7	33.4	33.3	33.3	33.6	33.8	34.2
February	35.4	35.4	35.4	35.1	35.1	35.1	34.9	34.8	...	...	34.9	35.0	34.8	34.6	34.6	34.6	34.8	34.9	34.9	34.4	34.0	33.7	33.5	33.5	33.8	33.8	34.4
March	35.6	35.7	35.6	35.3	35.3	35.4	35.1	35.1	...	...	35.2	35.2	35.0	35.0	35.0	34.9	35.3	35.4	35.2	34.6	34.2	33.9	33.7	33.6	33.9	34.2	34.6
April	35.9	35.9	35.8	35.6	35.7	35.8	35.4	35.3	...	...	35.4	35.6	35.3	35.3	35.2	35.2	35.5	35.5	35.3	34.9	34.5	34.1	34.0	33.8	34.1	34.4	34.8
May	36.2	36.3	36.2	36.1	36.1	36.0	35.7	35.5	...	...	35.5	35.8	35.5	35.5	35.3	35.3	35.6	35.7	35.4	35.1	34.6	34.3	34.2	34.1	34.2	34.6	34.9
June	36.3	36.4	36.2	36.2	36.3	36.2	35.9	35.7	...	...	35.7	35.9	35.7	35.7	35.6	35.6	35.8	35.9	35.6	35.3	34.9	34.6	34.3	34.3	34.5	34.7	35.0
July	36.4	36.5	36.3	36.2	36.4	36.3	36.2	35.9	...	...	35.8	36.0	35.8	35.8	35.9	35.8	35.9	36.0	35.8	35.4	35.1	34.6	34.5	34.4	34.5	34.8	35.1
August							36.4	36.1	...	...	36.1	36.2	36.1	36.1	36.1	36.0	36.1	36.2	36.0	35.7	35.2	35.0	34.7	34.6	34.8	35.0	35.3

\* Holiday ‡ No Market.

## Imports, Consumption and Stocks

The accompanying graph covers the crude rubber supply. Consumption and stocks for 1926 and the first nine months of 1927. Stocks on hand in the United States declined about 2,300 tons to 96,148 tons on August 31. It is estimated that they will remain unchanged during September as manufacturers have been practically out of the market during the past month.



U. S. Imports, Consumption, Stocks, 1926-1927

Imports and consumption in September are each estimated at 31,000 tons or 2,000 tons less than in August. London stocks declined about 600 tons the first two weeks in September and then advanced to the end of the month when they regained the level of August 31.

### UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

	Imports Tons	Con- sumption Tons	Stocks		London Tons	Singapore and Penang Tons†
			On Hand† Tons	Afloat† Tons		
1925						
Twelve months.	384,837	389,136	51,000*	48,000*		
1926						
Twelve months	411,900	358,415	72,510*	52,019*		
1927						
January.....	45,736	31,500	76,171	45,218	54,786	26,443
February.....	29,446	29,000	76,000	48,000	56,962	26,766
March.....	39,500	36,100	51,086	49,597	63,167	27,844
April.....	48,700	35,900	92,800	39,000	67,034	24,543
May.....	36,569	34,590	94,600	44,200	56,668	25,133
June.....	33,194	33,900	89,250	47,233	64,486	21,898
July.....	38,667	29,219	98,469	40,587	63,626	18,674
August.....	33,068	33,460	96,148	40,937	64,842	21,764
Sept. 26 (est)...	31,000	31,000	96,148	44,000		

\*December 31, 1925 and 1926.

†The first of each month.

### PRIZES FOR HIGHWAY SAFETY SUGGESTIONS

In an effort to reduce the number of highway accidents, the American Road Builders' Association has offered prizes totaling \$1,000 for the best workable plans that will decrease street and highway accidents. The contest is held in connection with a national safety campaign and is open to everyone, the closing date being midnight, November 15. Winners will be announced in the press and by radio January 11, 1928, during the annual convention and road show of the association in Cleveland, January 9 to 13. First prize in the contest is \$500, with nine others totaling \$500.

FRENCH RUBBER FOOTWEAR EXPORTS DURING THE FIRST HALF OF 1927 totaled 1,698,900 gross kilos as compared with 1,826,400 gross kilos in the first half of 1926. Under French official trade statistics, all sorts of rubber boots and shoes and canvas rubber soled shoes are reported in a single class.

AMERICAN RUBBER SOLED SHOES HAVE AN EXCELLENT MARKET IN France and are gradually replacing the white canvas rope soled bathing shoes formerly worn by most French tennis enthusiasts.

## Reclaimed Rubber Market

The demand for reclaim is quite active although slightly less than a month ago, but the indications are that very shortly business will exceed the volume of last month. Competition is quite keen. Reclaiming plants are running full and prices represent unusually good values.

In the past few weeks a number of the large tire companies began marketing a third line tire to meet the competition of the smaller manufacturers and share the profit to be had in the low price field. The prices for these tires are very low, to meet a popular demand. As long as this output holds in large volume the outlet for reclaimed rubber will continue good in this particular field.

High tensile red reclaim has been demonstrated in practice to be suited for red molded inner tubes, a construction which is superseding the usual wrapped tubes.

Quotations on all grades of reclaim remain unchanged from a month ago.

### New York Quotations

September 24, 1927

#### Auto Tire

	Specific Gravity	Price Per Pound
Black .....	1.21	\$0.08 @ \$0.08 1/4
Black, washed .....	1.18	.10 @ .10 1/4
Black selected tires .....	1.20	.08 1/4 @ .09
Dark gray .....	1.35	.11 1/4 @ .12
Light gray .....	1.38	.13 @ .13 1/4
White .....	1.40	.15 @ .15 1/4

#### High Tensile

Super-reclaim, No. 1 Black.....	1.20	.17 1/4 @ .18
No. 2 Black.....	1.20	.14 @ .14 1/4
High tensile red.....	1.20	.14 @ .14 1/4

#### Shoe

Unwashed .....	1.60	.08 @ .08 1/4
Washed .....	1.50	.10 1/4 @ .10 3/4

#### Tube

No. 1 .....	1.00	.17 @ .17 1/4
No. 2 .....	1.18	.13 1/4 @ .14 1/4

#### Miscellaneous

Red .....	1.35	.14 @ .14 1/4
Truck tire, heavy gravity.....	1.55	.07 1/4 @ .07 3/4
Truck tire, light gravity.....	1.40	.08 @ .08 1/4
Mechanical blends .....	1.60	.07 @ .08

### British Malaya

#### RUBBER EXPORTS

An official cablegram from Singapore to the Malay States Information Agency, 57 Charing Cross, London, S.W., 1, England, states that the amount of rubber exported from British Malaya during the month of August last totaled 30,371 tons. The amount of rubber imported was 17,105 tons of which 13,749 tons were declared as wet rubber. The following are comparative statistics relating to gross exports and foreign imports for 1926 and 1927.

	1926		1927	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January .....	30,452	10,237	34,946	14,995
February .....	30,440	8,306	27,528	11,697
March .....	35,012	14,800	41,346	17,462
April .....	23,727	10,565	29,041	13,069
May .....	31,231	10,604	31,393	15,491
June .....	30,624	11,764	32,607	14,706
July .....	28,824	15,280	23,947	12,697
August .....	34,625	13,595	30,371	17,105
Totals .....	244,935	95,151	251,179	117,222

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

#### DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of July and August, 1927:

	July, 1927 Tons	August, 1927 Tons
United Kingdom .....	5,239	8,023
United States of America .....	14,660	17,382
Continent of Europe .....	1,934	2,502
British Possessions .....	419	521
Japan .....	1,671	1,925
Other foreign countries .....	24	18
Totals .....	23,947	30,371

## The Market for Rubber Scrap

Business during September continued to show good activity, especially in inner tubes and tires. In all grades hand-to-mouth buying prevails. Tire and scrap collections have increased to some extent. Quotations on practically three quarters of the grades remain unchanged. All of the remainder are slightly decreased.

**AIR BRAKE HOSE.** The demand continues good and the prices steady.

**BOOTS AND SHOES.** While the demand is still fair many of the reclaimers have covered their requirements and this fact has caused a slight price reduction.

**INNER TUBES.** The inner tube market is still supported in the market by a demand for practically all grades of inner tube stock. Collections have fallen off and there is no reduction in prices.

**MECHANICAL GRADES.** These are still in very light demand. Quotations are all unchanged except for white druggists sundries which have declined 1 cent a pound.

**TIRES.** Tire stocks while still in good demand are entering the market in somewhat larger quantities causing the prices to ease off slightly, possibly from 50 cents to \$1.00 a ton.

### Quotations for Carload Lots

September 24, 1927

#### Boots and Shoes

Boots and shoes, black.....lb.	\$0.01½ @ \$0.01¾
Red and white.....lb.	.00¾ @ .00¾
Trimmed arctics, black.....lb.	.00¾ @ .00¾
Untrimmed arctics.....lb.	.00¾ @ .00¾
Tennis shoes and soles.....lb.	.01 @ .01

#### Hard Rubber

No. 1 hard rubber.....lb.	.09½ @ .10
Battery jars, black compound.....lb.	.01¾ @ .02

#### Inner Tubes

No. 1, floating.....lb.	.07¼ @ .07½
No. 2, compounded.....lb.	.05½ @ .05¾
Red.....lb.	.06 @ .06¼
Mixed tubes.....lb.	.05 @ .05½

#### Mechanicals

Mixed black scrap.....lb.	.00¾ @ .00¾
Heels.....lb.	.00¾ @ .00¾
Hose, air brake.....ton	30.00 @ 31.00
regular soft.....ton	15.00 @ 17.00
No. 1 red.....lb.	.01¾ @ .01¾
No. 2 red.....lb.	.01 @ .01
White, druggists' sundries.....lb.	.02½ @ .03
Mechanical.....lb.	.01½ @ .01¾

#### Tires

Pneumatic Standard—	
Mixed auto tires with beads.....ton	22.00 @ 23.00
Beadless.....ton	30.50 @ 31.50
White auto tires with beads.....ton	40.00 @ 42.00
Beadless.....ton	50.00 @ 52.00
Mixed auto peelings.....ton	32.00 @ 33.00
Solid—	
Mixed motor truck, clean.....ton	25.00 @ 26.00

## World Rubber Production—Net Exports

	Long Tons—1927					
	Three Months Ended March	April	May	June	July	August
British Malaya.....	59,754	15,972	15,902	17,901	11,250	13,266
Ceylon.....	17,410	3,349	3,124	3,348	4,018	5,357
India and Burma.....	3,514	723	760	856	.....	.....
Sarawak.....	2,508	984	786	1,100	859	1,133
British Borneo.....	*1,500	*500	*500	*500	*500	*500
Siam.....	1,096	526	348	409	333	546
Java and Madura.....	14,548	4,666	5,430	4,818	4,771	.....
Sumatra East Coast.....	20,234	5,530	5,528	5,519	6,140	.....
Other D. E. Indies.....	33,665	10,035	14,099	9,402	11,663	.....
French Indo-China.....	2,349	557	586	772	519	716
Amazon Valley.....	8,170	2,374	2,431	1,030	1,713	.....
Other America.....	540	177	153	.....	.....	.....
Mexican Guayule.....	1,173	491	399	400	399	.....
Africa.....	2,157	827	655	.....	.....	.....
Totals.....	168,618	46,711	50,701	.....	.....	.....

\* Estimate.

## United States Rubber Statistics

### IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	June, 1927		Six Months Ended June, 1927	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—Free				
Crude rubber.....	74,020,628	\$27,850,014	499,423,588	\$184,712,888
Balata.....	87,161	29,117	597,247	216,319
Jelutong or Pontianak.....	1,062,835	145,188	8,577,532	1,311,121
Gutta percha.....	167,429	17,407	1,626,372	326,128
Guayule.....	895,846	213,982	5,574,382	1,345,610
Rubber scrap.....	1,259,718	78,646	11,561,196	526,524
Totals.....	77,493,617	\$28,334,354	527,360,317	\$188,458,590
MANUFACTURED—dutiable	273,308	\$153,193	7,353,748	\$3,722,202
Rubber belting.....	65,755	\$38,081	339,686	\$206,967
Rubber tires.....	165	6,097	1,810	38,234
Other manufactures of rubber.....	.....	96,472	.....	660,803
Totals.....	65,920	\$140,650	341,496	\$906,004

### EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber.....	3,975,965	\$1,550,592	28,833,839	\$12,452,275
Balata.....	5,171	2,021	44,818	17,918
Gutta percha and rubber substitutes and scrap.....	28,869	2,373	71,470	5,885
Rubber manufactures.....	.....	38,408	.....	191,644
Totals.....	4,010,005	\$1,593,394	28,950,127	\$12,667,722

### EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India Rubber				
Reclaimed.....	1,529,428	\$147,009	10,522,541	\$1,056,248
Scrap and old.....	2,998,260	181,825	14,349,251	904,288
Footwear				
Boots.....pairs	22,542	68,512	213,675	591,947
Shoes.....pairs	117,331	105,348	511,022	431,249
Canvas shoes with rubber soles.....pairs	540,642	360,371	2,775,810	1,876,612
Rubber water bottles and fountain syringes.....number	10,394	7,557	120,841	76,743
Rubber gloves.....doz.	6,432	21,135	35,194	117,161
Other druggists' rubber sundries.....	.....	26,617	.....	200,337
Bathing caps.....doz.	9,307	20,352	112,785	225,904
Hard rubber goods				
Electrical hard rubber goods.....	69,020	13,721	551,357	134,982
Other hard rubber goods.....	.....	79,815	.....	205,152
Tires				
Casings, automobile.....number	278,662	3,462,953	1,423,926	17,952,914
Tubes, automobile.....number	169,560	339,080	804,992	1,665,302
Other casings and tubes.....number	5,061	13,671	25,027	74,523
Solid tires for automobiles and motor trucks.....number	6,075	197,022	53,650	1,650,806
Others.....	217,850	46,734	716,330	185,093
Tire accessories.....	184,374	.....	.....	897,501
Rubber and friction tape.....	114,142	30,374	783,357	228,618
Belting.....	367,731	205,230	2,431,482	1,298,213
Hose.....	635,686	235,431	3,557,932	1,372,243
Packing.....	226,575	86,989	1,223,601	551,625
Soles and heels.....	360,977	106,796	2,227,236	702,733
Thread.....	128,944	160,194	785,316	998,654
Rubber bands and erasers.....	62,261	46,214	426,709	314,257
Other rubber manufactures.....	.....	209,202	.....	1,227,474
Totals.....	.....	\$6,356,526	.....	\$34,940,579
Rubber toys and balls.....	.....	\$16,081	.....	\$88,344
Rubber balloons.....gross	42,901	\$61,372	269,689	\$349,743

## World Rubber Absorption—Net Imports

	Long Tons—1927					
	Three Months Ended March	April	May	June	July	.....
Australia.....	2,169	762	694	557	900	.....
Belgium.....	1,252	448	633	575	.....	.....
Canada.....	8,316	1,509	2,519	2,086	2,104	.....
Czechoslovakia.....	437	218	223	183	.....	.....
Denmark.....	155	27	75	20	.....	.....
Finland.....	156	34	76	39	43	.....
France.....	8,597	2,310	2,006	2,387	2,385	.....
Germany.....	9,059	2,393	3,380	3,632	2,946	.....
Italy.....	2,125	781	818	.....	.....	.....
Japan.....	4,707	2,181	1,084	798	1,505	.....
Netherlands.....	420	58	—57	—16	66	.....
Norway.....	152	33	42	71	.....	.....
Russia.....	2,494	1,972	887	1,506	415	.....
Spain.....	422	177	155	164	.....	.....
Sweden.....	574	136	142	113	102	.....
United Kingdom.....	26,932	7,875	2,896	2,282	1,116	.....
United States.....	100,451	44,627	33,761	31,270	35,720	.....
United States (Guayule).....	1,173	491	399	400	399	.....
Totals.....	169,591	66,032	49,847	.....	.....	.....

—Minus quantity; excess of exports over imports.  
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

# Compounding Ingredients Market

**R**UBBER manufacturing activity is proceeding at a good rate in most branches of the industry. Consequently compounding ingredients are moving in good volume to meet production requirements, and the outlook is good for continuance of the demand for tires and general rubber products.

**ACCELERATORS.** The progress of low cure development as factory practice is reflected in the call for the well known accelerators developed for that class of work. A notable general demand is evident for that form of elementary selenium specially prepared for use in rubber work in association with sulphur and an organic accelerator. It is finding a place in compounding for specification goods.

**ANTI-OXIDANTS.** This class of ingredient is now fully accepted for its beneficial effect in enhancing the keeping quality of rubber goods of every grade.

**BENZOL.** Early in the month the demand was good with ample stocks on hand and production not excessive. These conditions prevailed throughout the month with more activity noted toward the close. Prices unchanged.

**CARBON BLACK.** At prevailing prices new contracts are being taken slowly due to general lack of interest on the part of consumers. Some producers are said to be selling their gas for industrial purposes instead of burning it for black.

**LITHARGE.** Early in the month trading was from hand to mouth in anticipation of lower prices. In the second and third weeks two reductions each of 25 cents per 100 pounds were made. These price revisions notably stimulated buying interest.

**LITHOPONE.** Movements on contracts were steady and tended to improve with unchanged prices.

**MINERAL RUBBER.** There is no slackening in the demand for mineral rubber the production and importance of which is increasing.

**SOLVENT NAPHTHA.** Stocks are ample and prices somewhat unsettled because of competition. Demand has slackened temporarily.

**STEARIC ACID.** There is a steady call for this material at firm prices. Some producers are reported oversold.

**ZINC OXIDE.** Prices remained unchanged throughout the month but leaded grades showed weakness. Consuming demand showed reasonable activity.

## Accelerators, Inorganic

Lead, carbonate.....lb.	\$0.09 @
Lead, red.....lb.	.09 1/4 @
sublimed white.....lb.	.08 1/4 @
sublimed blue.....lb.	.08 1/4 @
super-sublimed white lead.....lb.	.08 3/4 @
Lime, R. M. hydrated.....ton	12.80 @
Litharge.....lb.	.08 3/4 @
Magnesia cal., light.....lb.	.15 @
calcined, extra light.....lb.	.25 @
calcined, heavy.....ton	75.00 @
magnesium, carb., light.....lb.	.06 @ .06 1/2
Orange mineral A.A.A.....lb.	11 1/4 @

## Accelerators, Organic

A-7.....lb.	.70 @ .80
A-11.....lb.	.75 @ .90
A-16.....lb.	.70 @ .85
A-19.....lb.	.75 @ .90
Aldehyde ammonia.....lb.	.65 @ .70
B. B.....lb.	.65 @
Captax.....lb.	.70 @
Crylene, hard form.....lb.	.50 @
Paste.....lb.	.50 @
Di-ortho-tolylguanidine.....lb.	.85 @ .90
Diphenyl guanidine.....lb.	.68 @ .72
Ethylidine aniline.....lb.	.60 @ .65
Formaldehyde aniline.....lb.	.38 @ .42
P. A. C.....lb.	.08 1/2 @ .09
Grasselator 102.....lb.	.65 @ .70
552.....lb.	4.45 @ 4.60
808.....lb.	1.05 @ 1.35
833.....lb.	1.55 @ 1.75
Heptene.....lb.	.62 1/2 @ .70
Hexamethylene tetramine.....lb.	.18 @ .20
Lithex.....lb.	.37 @
Methylene dianiline.....lb.	3.25 @
Monex.....lb.	.16 @
No. 999 lead oleate.....lb.	.76 1/2 @ .81
Phenyl orthotolyl guanidine.....lb.	.445 @ 4.60
Piperidine piperidyl.....lb.	.50 @ .55
R. & H. 40.....lb.	.50 @ .55
50.....lb.	1.20 @ 1.25
Safex.....lb.	.55 @ .60
Super-sulphur, No. 1.....lb.	.65 @ .70
No. 2.....lb.	3.25 @ 2.85 1/2
Tensilac No. 39.....lb.	.75 @ .78
No. 41.....lb.	1.20 @
Thionex.....lb.	.65 @ .70
Thiocarbamid.....lb.	.86 @
Trimene.....lb.	1.03 @
base.....lb.	.70 @
Triphenylguanidine.....lb.	.80 @ 1.00
Tuads.....lb.	
Vulcanex.....lb.	
Vulcanol.....lb.	
Vulcone.....lb.	
Z-88.....lb.	
Zimate.....lb.	

## Acids

Acetic 28% (bb.).....100 lbs.	3.37 1/2 @ 3.62 1/2
glacial (carbonyl).....100 lbs.	12.41 @ 12.66
Sulphuric, 66%.....100 lbs.	1.70 @

## New York Quotations

September 24, 1927

## Alkalies

Caustic soda, solid.....lb.	\$0.03 @
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## Anti-Oxidants

Aze-Rite.....lb.	@
Antox.....lb.	.77 @
Neozone.....lb.	.74 @
V. G. B.....lb.	@

## Colors

BLACK	
Bone.....lb.	.07 @ .21
Carbon (see Comp. Ing.)	
A. & W. nondi No. 1.....lb.	.40 @
No. 2.....lb.	.25 @
Drop.....lb.	.06 @ .10
Lampblack (commercial).....lb.	.09 @
BLUE	
A. & W. blue.....lb.	1.25 @ 5.00
Du Pont, N.....100 lbs.	1.35 @
Marine, A. C.....100 lbs.	1.30 @
5 R.....100 lbs.	1.00 @
2 G.....100 lbs.	.90 @
Prussian.....lb.	.31 @ .35
Ultramarine.....lb.	.06 @ .30
BROWN	
Sienna, Italian, raw.....lb.	.05 @ .12 1/2
GREEN	
A. & W. green.....lb.	1.25 @ 3.00
Chrome, light.....lb.	.27 @ .31
medium.....lb.	.28 @ .31
dark.....lb.	.30 @ .33
Du Pont, A. C.....100 lbs.	3.00 @
4 G.....100 lbs.	.60 @
G. L.....100 lbs.	.30 @
Y. L.....100 lbs.	.75 @
Oxide of chromium.....lb.	.38 @
ORANGE	
Du Pont, 2 R.....100 lbs.	1.40 @
R. X.....100 lbs.	1.30 @
Y. O.....100 lbs.	1.60 @
RED	
A. & W. red.....lb.	.75 @ 3.50
purple.....lb.	2.00 @ 4.00
Antimony, golden, No. 40.....lb.	.22 @ .25
No. 60.....lb.	.16 @ .20
golden 15/17%.....lb.	@
T. K. "Special" 1%.....lb.	@
Pentasulphide 15/17%.....lb.	@

## Colors—(Continued)

Antimony	
Crimson, R.M.P. No. 3.....lb.	\$0.48 @
Sulphur free.....lb.	.52 @
T. K. 15/17%.....lb.	@
7-A.....lb.	.35 @
Z-2.....lb.	.22 @
Vermilion, No. 5.....lb.	@
No. 15.....lb.	@
Du Pont R. L.....100 lbs.	2.00 @
6 B.....100 lbs.	1.10 @
Brilliant A. C.....100 lbs.	1.05 @
Iron Oxides	
bright pure domestic.....lb.	.12 @
bright pure English.....lb.	.14 @
bright reduced English.....lb.	.10 1/2 @
bright reduced domestic.....lb.	.10 @
Indian (maroon), pure domestic.....lb.	.11 @
Indian (maroon), pure English.....lb.	.10 1/2 @ .11
Indian (maroon), reduced English.....lb.	.09 1/2 @ .10
Indian (maroon), reduced domestic.....lb.	.08 @
Oximony.....lb.	.13 1/4 @
Spanish red oxide.....lb.	.04 @
Venetian red.....lb.	.02 @ .06
Vermilion, English quick-silver.....lb.	1.85 @
WHITE	
Lithopone.....lb.	.05 1/2 @ .05 3/4
Azolith.....lb.	.05 1/4 @ .05 3/4
Grasselli.....lb.	.05 1/2 @ .05 3/4
Sterling.....lb.	@
Zinc Oxide	
AAA (lead free).....lb.	.07 @
Azo (factory):	
ZZZ (lead free).....lb.	.06 1/2 @ .07
ZZ (leaded).....lb.	.06 1/4 @ .07 1/4
Z (8% lead).....lb.	.06 3/4 @ .07 1/4
French Process	
Green seal.....lb.	.10 1/2 @
Red seal.....lb.	.09 1/2 @
White seal.....lb.	.11 1/2 @

## YELLOW

A. & W. yellow.....lb.	2.00 @ 4.00
T. K. sulphide.....lb.	.65 @
Cadmium sulphide.....lb.	.95 @ 1.25
Chrome.....lb.	.16 @ .20
Du Pont N.....100 lbs.	4.00 @
R. R.....100 lbs.	1.55 @
Grasselli cadmium.....lb.	1.50 @
Ochre, domestic.....lb.	.01 1/2 @ .02 1/4
Oxide, pure.....lb.	.10 1/2 @
Zinc imported.....lb.	.24 @

## Compounding Ingredients

Aluminum flake (sacks c.l.)..ton	\$21.85	@
(sacks l.c.l.).....ton	24.50	@
Ammonium carbonate powd..lb.	.11½	@
lump .....	.10½	@
Asbestine .....	13.40	@14.50
Barium, carbonate.....ton	50.00	@55.00
dust .....	@	
sulphate, dry .....	@	
Barytes, imported.....ton	27.00	@34.00
dry ground, white.....ton	35.00	@
dry ground, off color.....ton	25.00	@
No. 1 Missouri, water ground and floated, St. Louis.....ton	21.60	@23.60
Basefor .....	.04½	@
Blanc fixe, dry.....lb.	.04¼	@.04½
pulp .....	60.00	@63.00
Carbon Black		
Aerfloted arrow .....	.08	@.12
Compressed .....	.07½	@.11
Uncompressed .....	.07	@.11
Micronex .....	.08	@.12
Carrara filler .....	26.00	@
Chalk, precipitated.....lb.	.04¼	@.04½
Clay, Blue Ridge, dark.....ton		
China .....	.01½	@
Dixie .....	@	
Mineral flour (Florida).....ton	20.00	@23.00
Perfection .....	14.80	@
Suprex .....	13.00	@26.00
Cotton flock, black.....lb.	.10	@.12
light-colored .....	.12	@.14
white .....	.12½	@.27
Fossil flour.....lb.	.02½	@
Glue, high grade.....lb.	.22	@.26
low grade .....	.18	@.22
Infusorial earth .....	.02½	@
Mica, amber (fact'y).....ton	80.00	@
Pumice stone, powd.....lb.	.02½	@.04
Rotten stone (bbbs.).....lb.	.02½	@.04½
Soap bark .....	.16	@.18
Soapstone .....	15.00	@22.00
Talc, domestic .....	18.00	@25.00
French .....	18.00	@22.00
Thermatonic carbon.....lb.	@	
Titanox .....	.10	@.10½

## New York Quotations

September 24, 1927

## Compounding Ingredients—(Continued)

Velvetex .....	lb.	\$0.04	@ \$0.07
Whiting:			
Commercial .....	100 lbs.	.85	@ 1.00
English, cliffstone.....	100 lbs.	1.50	@
Quaker .....	ton		@
Snow white.....	ton	12.00	@ 23.60
Sussex .....	ton		@
Westminster Brand.....	100 lbs.		@
Witco (c.l.) (fact'y).....	ton	12.00	@
Whiting, imp. chalk.....	100 lbs.	1.00	@ 1.25
Paris White, Eng. Cliff.....	100 lbs.	1.50	@ 3.00

## Factice—See Rubber Substitutes

## Mineral Rubber

Fluxrite (solid).....lb.	.05	@.06
Genasco (fact'y).....ton	50.00	@52.00
Gilsonite (fact'y).....ton	37.14	@39.65
Granulated M. R. ....ton	@	
Hydrocarbon, hard.....ton	@	
Hydrocarbon, soft.....ton	28.00	@34.00
Ohmic Kapack, M. R.....ton	40.00	@90.00
M-4 .....	175.00	@
Paradura (fact'y).....ton	62.50	@65.00
Pioneer, M. R. solid (fac.).....ton	42.00	@45.00
M. R. granulated.....ton	52.00	@55.00
Robertson, M. R., solid (fact'y).....ton	34.00	@38.00
M. R. gran. (fact'y).....ton	34.00	@80.00

## Oils

Mineral .....	gal.	.15	@	.30
Spindle .....	gal.	.26	@	
Kerosene .....	gal.	.16	@	.17
Rapeseed .....	gal.	.80	@	.81
Red oil (bleic acid).....	lb.	.09½	@	.10

## Rubber Substitutes or Factice

Black .....	lb.	.08	@.14
Brown .....	lb.	.03	@.16
White .....	lb.	.09	@.16½

## Softeners

Corn oil .....	lb.	.12	@	
Cotton oil.....	lb.	.11½	@	
Cycline oil.....	gal.	.28	@	.34
Degras .....	lb.	.03¾	@	.04
Fluxrite (fluid).....	lb.	.05	@	.06
Palm oil (Lagos).....	lb.	.07¾	@	.11
Palm oil (Niger).....	lb.	.07¾	@	.10½
Palm oil (Witco).....	lb.	.08¼	@	

## Softeners—(Continued)

Petrolatum .....	lb.	\$0.05¾	@	
Pigmentar .....	gal.	.33	@	.41
Pine oil .....	gal.	.68	@	.70
Pine tar (retort).....	bbl.	13.00	@	14.00
Plastone .....	lb.	.36	@	
Rosin K.....	bbl.	11.00	@	
Rosin oil .....	gal.	.58	@	.65
Tackol .....	lb.	.10	@	.12
Shellac, orange.....	lb.	.70	@	
Stearic acid .....	lb.	.11	@	.15
Stearic acid .....	lb.	.13½	@	.14

## Solvents

Benzol (90%, 7.21 lbs. gal.) gal.	.28	@
Carbon bisulphide (99.9%, 10.81 lbs. gal.) (drums).....lb.	.05	@.06
tetrachloride (99.7%, 13.28 lbs. gal.) (drums).....lb.	.07½	@.08

## Gasoline

No. 303			
Tankcars .....	gal.	.16	@
Drums, c. l. ....	gal.	.25	@
Drums, l. c. l. ....	gal.	.27	@
Solvent naphtha .....	gal.	.40	@
Turpentine, spirits.....	gal.	.56	@ .57
steam distilled.....	gal.	.52	@ .54

## Vulcanizing Ingredients

Vulcanizing ingredients			
Sulphur			
Velvet flour (bbls.)	240 lbs	2.95	@ 3.50
(bags)	150 lbs.	2.60	@ 3.15
Soft rubber (c.l.)	100 lbs.		@
(l.c.l.)	100 lbs.		@
Superfine commercial flour			
(bbls.)	210 lbs.	2.55	@ 3.10
(bags)	100 lbs.	2.20	@ 2.80
Tire brand, superfine	100 lbs.		@
Tube brand, velvet	100 lbs.		@
(See also Colors—Antimony)			

## Waxes

Beeswax, white, com.....lb.	.55	@
carnauba .....	.38	@.50
ceresine, white.....lb.	.12	@
montan .....	.07	@.07½
orokerite, black .....	.27	@
green .....	.28	@

## Paraffin

122/124 white crude scale.....lb.	.03	@
124/126 white crude scale.....lb.	.03¾	@
120/122 fully refined.....lb.	.05½	@
125/127 fully refined.....lb.	.05¾	@

## SEPARATING GRIT FROM CARBON BLACK

In the separation of grit from carbon black, Godfrey L. Cabot, Inc., gives an interesting example of the rapidity with which a modern manufacturer must adapt his processes to changing conditions. When the Cabot factory at Eliasville was built the first of last year, a new type of air bolter was installed instead of the usual pan bolter. In this air bolter the black was blown through a fine wire screen by a strong air current. Within a few months these bolters were entirely replaced by bolters of an improved type which are now, in turn, being replaced by an air separator in which no screen whatever is used. It is claimed that this newest air separator will remove particles of grit which pass through the finest commercial screen. Its design was based on the principles of aerodynamics, yet several models of commercial size were built and junked before the final design was adopted.

One criterion of the efficiency of this separator is a comparison of its product on a 300 mesh test sieve, washing the black through the sieve with alcohol or gasoline, but even this rigid test does not tell the whole story, for a sieve does not separate grit particles finer than its aperture. It is claimed that such grit particles are always present in bolted blacks.

Air separators are now being installed at the principal plants of the Godfrey L. Cabot, Inc. The Cabot company does not define grit as the residue left on a sieve of any fineness, for obviously such grit can be reduced by grinding. Grit is more accurately defined as hard material of high apparent specific gravity, lacking entirely in the reinforcing and coloring properties characteristic of carbon black. Cabot's new separation method utilizes the difference in ratio of weight to effective surface and therefore gives a fundamental rather than an empirical separation.

## AVOID OVERMILLED CEMENT RUBBER

Some foremen who have been very successful in cement making attribute their success not only to very careful selection of crude stock, but to their refusal to use any overmilled rubber. Use of the latter, they contend, almost invariably results in a cement of low viscosity, despite the claims of some that practically any good crude stock, even though well milled, can be converted into good cement with a suitable solvent and an efficient churn. The contention is made that overmilling is just as damaging to stock designed for solution as to that intended for working with the familiar ingredients for tubing, sheeting, etc.

Researchers trace the trouble to the crushing by the mill of the ultimate rubber particles, especially to the rupture of the elastic skin or capsule inclosing the inner fluid, which two-phase globular system is revealed by micro-dissection of the particles. It has long been observed that even the more refined compounding and vulcanizing methods can not adequately offset the harm (especially in loss of nerve) done in overworking rubber. Scientists confirm practical experience and stress the necessity of maintaining intact as far as possible in all processes (even in cement making) the minute, original structure of the rubber particle. On its breakdown is blamed both lessened nerve in solid and lower viscosity in fluid rubber products.

DEPARTMENT OF COMMERCE STATES THAT THE OUTLOOK FOR imported casings to Australia is far from good, except during the next six months or so. As soon as local requirements can be met by Australian factories, it seems certain that a higher tariff will be placed on tires, making imports practically prohibitive.

October 1, 1927

INDIA RUBBER WORKS

# WISHNICK TUMPF INC.

now operating  
The PIONEER  
ASPHALT  
Lawrence



# NE & CO.

th Street

RK

in Street

JACKET CLOTH

MELLING DUCK

BURG

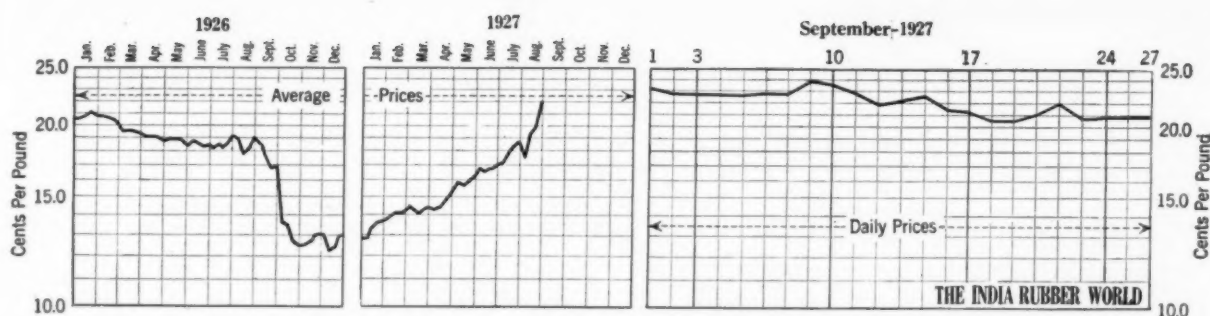
RUBBER TRADE

NON MILLS, Inc.  
SELLING AGENTS



ORK  
Street  
TLAND

CHICAGO  
327 So. La Salle Street  
A. W. REID



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

## Market for Cotton and Fabrics

**AMERICAN COTTON.** The price for spot middling cotton on September 1 was 23.10 cents. There were relatively minor declines in the price down to 22.60 cents on September 6, when an upward trend began carrying the price to 23.90 cents on September 9. This rise was due to the government estimate reported September 8, placing the crop as 12,692,000 bales, a reduction of about 800,000 bales from the estimate given on August 8. The sharp advance was followed by a reaction dropping the price to 22.55 cents on September 15. On this date the prediction of the United States Bureau of Economics that the price of cotton was likely to decline disrupted the market. The spot price dropped abruptly to 20.55 cents on September 20, resulting in heavy losses. The spot market was completely demoralized and a sharp general protest issued to the Secretary of Agriculture, insisting on the discontinuance for the future of price predictions on the part of this bureau. The prompt announcement of the secretary that the bureau would cease its predictions of price trends met with general approbation and brought into evidence some little confidence in the market. Spot on September 27 had recovered to 21.00 cents a pound.

**EGYPTIAN COTTON.** Recently all staple cottons have been following the violent fluctuations in the New York market without appreciable easing of the basis. The Egyptian Government has just issued a crop estimate of 3,362,000 centars, of which 2,600,000 are Sakel. This estimate is considerably in excess of expecta-

tions and is accounted for by an unexpectedly large yield per acre, owing to the excellent condition of the plants.

**ARIZONA COTTON.** Reports from Arizona indicate an increased yield per acre over expectations of a month ago, and it is hoped that a crop of 25,000 to 30,000 bales will be gathered.

### Cotton Fabrics

**DUCKS, DRILLS AND OSNABURGS.** The stock of fabrics on hand is small, with strong sales market at advancing prices as compared with a month ago. In fact the stocks of some mills are entirely sold up through the fall and since the last government crop estimate, gray merchandise has been moving satisfactorily.

**SHEETING.** The sheeting market is quiet and prices fluctuating. Stocks are not excessive.

**TIRE FABRICS.** As to market conditions, the radical changes in the price of cotton both up and down have greatly disturbed buyers and very few are doing anything but filling in for nearby needs. They are apparently awaiting a more settled condition of the cotton market before placing any forward deliveries. Inasmuch as the general trend of the cotton market has been to higher levels, the prices of finished goods have increased somewhat but are not yet up to a parity with cotton. In a few instances where mills need business badly to keep them running, they have booked orders for fabric at very much below replacement value so that there is a wide range in quotations received by prospective buyers.

### Drills

38-inch 2.00-yard.....yard	\$0.20 1/4 @
40-inch 3.47-yard.....	.12 1/4 @
50-inch 1.52-yard.....	.27 1/4 @
52-inch 1.90-yard.....	.23 1/4 @
52-inch 2.20-yard.....	.19 1/4 @
59-inch 1.85-yard.....	.23 1/4 @

### Ducks

38-inch 2.00-yard S. F. yard	.21 @
40-inch 1.45-yard S. F. ....	.28 1/4 @
72-inch 1.05-yard D. F. ....	.42 1/4 @
72-inch 1.66-ounce.....	.45 1/4 @
72-inch 17.21-ounce.....	.47 1/4 @

### MECHANICAL

Hose and belting.....pound	.39 @
Specials.....	.43 @

### TENNIS

52-inch 1.35-yard.....yard	.32 @
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### Hollands

#### RUBBER TRADE SPECIAL

R. T. 3 A.....yard	.20 @
31-inch.....	.25 @
40-inch.....	.25 @
50-inch.....	.45 @

#### RED SEAL

36-inch.....	@
48-inch.....	@
50-inch.....	@

#### GOLD SEAL

48-inch, No. 72.....	@
48-inch, No. 80.....	@

### New York Quotations

September 24, 1927

### Osnaburgs

40-inch 2.35-yard.....yard	\$0.17 1/4 @
40-inch 2.48-yard.....	.16 1/4 @
40-inch 3.00-yard.....	.13 1/4 @
37-inch 2.42-yard.....	.17 @

### Raincoat Fabrics

#### COTTON

Bombazine 64 x 60.....yard	.11 1/4 @
Bombazine 60 x 48.....	.12 1/4 @
Plaids 60 x 48.....	.13 1/4 @
Plaids 64 x 60.....	.14 1/4 @
Surface prints 60 x 48.....	.13 1/4 @
Surface prints 64 x 60.....	.14 1/4 @
Print cloth 38 1/2-inch, 64 x 60.....	.09 1/4 @

### Sheetings, 40-inch

48 x 48, 2.50-yard.....yard	.15 1/4 @
48 x 48, 2.85-yard.....	.13 1/4 @
64 x 68, 3.15 yard.....	.13 1/4 @
56 x 60, 3.60-yard.....	.12 @
48 x 44, 3.75-yard.....	.10 1/4 @

### Sheetings, 36-inch

48 x 48, 5.00-yard.....yard	.08 1/4 @
44 x 40, 6.15-yard.....	.06 1/4 @

### Tire Fabrics

#### SQUARE WOVEN 17 1/2-ounce

Egyptian, karded.....pound	\$0.50 @
Peeler, karded.....	.50 @
BUILDER 23/11.....	.47 @
Peeler, karded.....	.44 @
BUILDER 10/5.....	.44 @
Peeler, karded.....	.44 @

#### CORD 23/5/3

Egyptian, combed.....pound	.63 @
Egyptian, karded.....	.58 @
Peeler, karded, 1 1/4-in.....	.47 @

#### CORD 23/4/3

Peeler, karded.....pound	.50 @
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#### CORD 23/3/3

Peeler, karded.....pound	.45 1/4 @
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#### CORD 15/3/3

Peeler, karded.....pound	.45 @
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#### CORD 13/3/3

Peeler, karded.....pound	.44 @
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#### LENO BREAKER

8-oz. Peeler, karded...pound	.46 @
10-oz. Peeler, karded.....	.46 1/4 @

#### CHAFER

9.5-oz. Peeler, karded.pound	.40 @
12-oz. Peeler, karded.....	.42 @
14-oz. Peeler, karded.....	.46 @

## The Cotton Outlook

The following statistics and summary quoted from the *Commerce Monthly* of the National Bank of Commerce, New York, N. Y., presents in concise and comprehensive view the present and prospective situation in the cotton industry.

### APPROXIMATE WORLD SUPPLY OF COTTON OF ALL KINDS ON JULY 31, WORLD COTTON PRODUCTION IN SUCCEEDING TWELVE MONTHS AND PRICE OF COTTON AS OF THE MIDDLE OF AUGUST, 1921-27.

	1921	1922	1923	1924	1925	1926	1927
	(Thousands of running bales)						
United States: supply (carryover, crop, imports, etc.) <sup>*</sup>	17,172	14,926	13,764	12,884	15,802	18,044	21,888
Mill consumption <sup>*</sup>	4,893	5,910	6,665	5,681	6,193	6,456	7,203
Net exports <sup>*</sup>	5,745	6,184	4,774	5,647	7,999	8,045	10,923
Total consumption and exports <sup>*</sup>	10,638	12,094	11,439	11,328	14,192	14,501	18,126
United States stocks on July 31 <sup>*</sup>	6,534	2,832	2,325	1,556	1,610	3,543	3,762
Visible supply abroad on July 31 <sup>*</sup>	3,644	2,871	1,552	1,785	1,972	2,357	3,731
Mill stocks abroad on July 31 <sup>*</sup>	3,509	3,861	2,862	2,868	3,414	3,420	§
World commercial stock on July 31 <sup>*</sup>	13,687	9,564	6,739	6,209	6,996	9,320	§
Price of middling cotton as of mid-August—	(cents per pound)						
Spot New Orleans	12.13	20.50	24.50	26.90	23.10	18.10	18.64
Crop of following season in U. S. <sup>†</sup>	7,954	9,762	10,140	13,628	16,104	17,977	§
Crop of following season outside U. S. <sup>†</sup>	7,376	9,406	9,450	11,272	11,796	10,223	§
Total world crop of following season <sup>‡</sup>	15,330	19,170	19,590	24,900	27,900	28,200	§

<sup>\*</sup>U. S. Department of Commerce. Foreign cotton imported into United States is reckoned in equivalent 500-lb. bales in figures for imports, consumption and stocks.

<sup>†</sup>Financial and Commercial Chronicle. Does not include Japanese port stocks.

<sup>‡</sup>International Federation of Master Cotton Spinners' and Manufacturers' Associations.

<sup>§</sup>Not available.

<sup>¶</sup>U. S. Department of Agriculture.

With prices fully recovered from the decline of last fall, there is little evidence that textile sales will be restricted, but there is even less reason to foresee any new boom in the world's cotton manufacturing industry.

On the whole, the world's cotton mill industry seems to be in a fairly favorable position, but in view of the considerable supplies available in secondary markets it cannot be expected that the demand for cotton from the United States will reach the enormous totals of the year just passed. But the farmers have prepared for a decline in this demand by the reduction in their acreage, and while unfavorable growing conditions have been encountered in some parts of the belt the outlook is still for a crop and a price which will give reasonable satisfaction to all parties.

### Government Cotton Standards Test

Any holder of practical forms of universal standards for American cotton who has doubt of the accuracy of any of them may have a test made thereof under standard conditions if sent to the division of cotton marketing in the Bureau of Agricultural Economics, Department of Agriculture. As an outgrowth of the move made by the Texas Cotton Association to bring about an agreement for official types representing the various staple conceptions which now are sold to Europe on description, there has come opposition from abroad involving the stability of the standards covered by the international agreement.

The Bureau of Agricultural Economics has in the testing laboratory of its division of cotton marketing a conditioning room and equipment with which within ordinary limits it is possible to maintain with a high degree of constancy any desired temperature and humidity. It is also equipped with the latest scientific apparatus for measuring either the human or modal length of cotton

fibers, or the length of individual fibers and for calculating the distribution of different lengths of fiber in a given sample.

### Bill to Prevent Price Predictions

The disastrous effect upon cotton prices caused by a cotton price prediction by the Department of Agriculture, September 15, has led Senator Harris of Georgia to draft a bill to make such forecasts illegal. The Harris bill will be introduced on the opening of Congress and would make it a misdemeanor, punishable by a fine and further punishable by instant dismissal from the government service, of any individual making a price prediction under cloak of governmental sanction in regard to cotton, wool, wheat, corn, "or any other agricultural commodity." There is no law either permitting or forbidding price forecasts at present.

The Department of Agriculture has assumed responsibility for the inclusion in a review by its Bureau of Agricultural Economics, of a sentence which predicted that under certain circumstances which it outlined, the price of cotton would decline, and Secretary Jardine has announced that there shall be no recurrence of such statements, but no effort apparently is being made to fix individual responsibility for a forecast which has cost the farmers of the South millions of dollars.

### Decline in Cotton

In regard to the decline in cotton the *New York Times* on September 26 states as follows:

The decline in prices was largely due to liquidation of held-over long interests who feared that the Census Bureau would show total ginnings prior to September 16 of about 4,000,000 bales. Other reasons were, the excellent weather in the belt and the claim of many traders that because of this better weather the crop will improve sufficiently to warrant the government in forecasting a larger yield than that of September 8 when it issues its next report October 8.

Those who would like to see prices react from the downward trend, point out that considering the early maturity of the crop, the exceptionally fine weather for picking and ginning and the incentive to harvest and market cotton at prevailing prices, the ginnings were by no means large.

While there has been no frost, the weather has been cold enough to arrest the vigor of the plants and relief from the heat has been favorable to the activities of the boll weevil, which has already damaged the crop to a material extent.

Another reason assigned for the recent drop in prices is the claim by many that the advance had been too rapid, leaving the market overbought and topheavy. If this condition actually existed, the decline of more than 4 cents a pound from the high mark of the season has about corrected the supposed evil, leaving the market pretty thoroughly liquidated and therefore in a technically healthier condition.

These advocates of higher prices point to the fact that nearly all the private advices received from the interior claim that despite the good weather the crop has not improved, that the plants have ceased to make cotton and that despite the large ginnings so far, the gins in many parts of the country are preparing for an early termination of activity and in many instances are already slowing down to several days instead of running daily and even at nights as was the rule last year.

### HELPING INDIA RUBBER WORLD READERS

Contentment may be an asset to a pensioner, but it is a liability to any man in business. Nor does there appear to be any middle course in industrial life. We progress or we retrograde; and now more than ever is success conditioned upon well-directed enterprise. Eager to aid its readers in reaching that goal, INDIA RUBBER WORLD, which for nearly forty years has supplied the rubber industry with a vast amount of helpful information, is planning to be of even greater service than ever. While paying the utmost regard to theoretical advancement, more than ever it will emphasize the practical side of the rubber industry by showing how old methods can be improved upon, more efficient equipment can be utilized, better goods be produced, greater savings effected in time and materials, larger profits earned, and more benefits obtained generally for employer and employee. To accomplish this it cordially welcomes any suggestions its readers may kindly offer.

# Crude Rubber Arrivals at New York as Reported by Importers

Plantations	CASES
AUGUST 15. By "Atlanta City," Far East.	
General Rubber Co.	4,901
Hood Rubber Co.	132
The Meyer & Brown Corp.	829
The Meyer & Brown Corp.	1130
AUGUST 15. By "Minnekahda," Far East.	
General Rubber Co.	750
Littlejohn & Co., Inc.	168
AUGUST 15. By "Titan," Far East.	
General Rubber Co.	3,070
AUGUST 15. By "Volendam," Europe.	
General Rubber Co.	106
AUGUST 17. By "Francisco," Europe.	
General Rubber Co.	223
AUGUST 18. By "Mahout," Far East.	
Baird Rubber & Trading Co., Inc.	880
General Rubber Co.	1,146
Haldane Bierrie & Co., Inc.	100
Littlejohn & Co., Inc.	100
Poel & Kelly, Inc.	14
Rogers Brown & Crocker Bros., Inc.	56
Charles T. Wilson Co., Inc.	168
AUGUST 19. By "City of Kobe," Far East.	
H. A. Astlett & Co.	976
Baird Rubber & Trading Co., Inc.	550
General Rubber Co.	4,089
Haldane Bierrie & Co., Inc.	151
Hood Rubber Co.	1,132
Littlejohn & Co., Inc.	3,249
The Meyer & Brown Corp.	pkgs.
H. Muehlstein & Co., Inc.	300
Poel & Kelly, Inc.	269
Rogers Brown & Crocker Bros., Inc.	420
Charles T. Wilson Co., Inc.	840
AUGUST 20. By "Veendam," Europe.	
H. A. Astlett & Co.	102
Haldane Bierrie & Co., Inc.	100
Littlejohn & Co., Inc.	223
The Meyer & Brown Corp.	pkgs.
AUGUST 22. By "Cedric," Europe.	
Littlejohn & Co., Inc.	48
AUGUST 22. By "Collamer," Europe.	
General Rubber Co.	56
AUGUST 22. By "London Exchange," London.	
Baird Rubber & Trading Co., Inc.	409
Littlejohn & Co., Inc.	1,809
The Meyer & Brown Corp.	pkgs.
AUGUST 22. By "Minnewaska," Europe.	
H. A. Astlett & Co.	147
Baird Rubber & Trading Co., Inc.	258
General Rubber Co.	65
Littlejohn & Co., Inc.	120
The Meyer & Brown Corp.	pkgs.
H. Muehlstein & Co., Inc.	100
Charles T. Wilson Co., Inc.	79
AUGUST 22. By "Nortonian," London.	
Hood Rubber Co.	120
AUGUST 24. By "Djamba," Far East.	
H. A. Astlett & Co.	795
Baird Rubber & Trading Co., Inc.	183
General Rubber Co.	6,475
Hood Rubber Co.	1,704
Littlejohn & Co., Inc.	1,669
Meyer & Brown, Inc.	pkgs.
The Meyer & Brown Corp.	388
H. Muehlstein & Co., Inc.	294
Poel & Kelly, Inc.	835
Raw Products Co.	160
Rogers Brown & Crocker Bros., Inc.	96
Charles T. Wilson Co., Inc.	972
AUGUST 25. By "Pres. Van Buren," Far East.	
H. A. Astlett & Co.	781
Baird Rubber & Trading Co., Inc.	2,574
General Rubber Co.	5,234
Haldane Bierrie & Co., Inc.	275
Hood Rubber Co.	pkgs.
Littlejohn & Co., Inc.	3,831
The Meyer & Brown Corp.	810
H. Muehlstein & Co., Inc.	480
Poel & Kelly, Inc.	585
Raw Products Co.	400
Rogers Brown & Crocker Bros., Inc.	1,269
Charles T. Wilson Co., Inc.	344

\* Arrived at Los Angeles.

† Arrived at Boston.

AUGUST 28. By "New Amsterdam," Europe.	CASES
Littlejohn & Co., Inc.	356
AUGUST 29. By "London Commerce," Europe.	
General Rubber Co.	6,368
AUGUST 29. By "Minnesota," London.	
Haldane Bierrie & Co., Inc.	50
AUGUST 29. By "Tuscania," London.	
Charles T. Wilson Co., Inc.	395
AUGUST 31. By "Agapenor," Far East.	
H. A. Astlett & Co.	819
Baird Rubber & Trading Co., Inc.	1,850
General Rubber Co.	9,151
Haldane Bierrie & Co., Inc.	100
Littlejohn & Co., Inc.	4,319
The Meyer & Brown Corp.	pkgs.
The Meyer & Brown Corp.	986
H. Muehlstein & Co., Inc.	450
Poel & Kelly, Inc.	466
Raw Products Co.	320
Rogers Brown & Crocker Bros., Inc.	200
Charles T. Wilson Co., Inc.	769
SEPTEMBER 1. By "Lancaster Castle," Far East.	
H. A. Astlett & Co.	813
Baird Rubber & Trading Co., Inc.	350
General Rubber Co.	9,155
Haldane Bierrie & Co., Inc.	349
Hood Rubber Co.	268
Littlejohn & Co., Inc.	4,125
The Meyer & Brown Corp.	pkgs.
H. Muehlstein & Co., Inc.	672
Poel & Kelly, Inc.	725
Raw Products Co.	375
Rogers Brown & Crocker Bros., Inc.	14
Charles T. Wilson Co., Inc.	1,534
SEPTEMBER 5. By "Minnetonka," London.	
Baird Rubber & Trading Co., Inc.	574
H. Muehlstein & Co., Inc.	266
Charles T. Wilson Co., Inc.	40
SEPTEMBER 5. By "Missouri," London.	
Hood Rubber Co.	1364
SEPTEMBER 6. By "City of Lahore," Far East.	
General Rubber Co.	222
Haldane Bierrie & Co., Inc.	100
Hood Rubber Co.	780
Littlejohn & Co., Inc.	560
Poel & Kelly, Inc.	210
SEPTEMBER 6. By "Rotterdam," Far East.	
H. Muehlstein & Co., Inc.	50
SEPTEMBER 8. By "Asiatic Prince," Far East.	
H. A. Astlett & Co.	1,072
Baird Rubber & Trading Co., Inc.	711
General Rubber Co.	2,309
Haldane Bierrie & Co., Inc.	172
Littlejohn & Co., Inc.	5,826
The Meyer & Brown Corp.	pkgs.
The Meyer & Brown Corp.	1,629
H. Muehlstein & Co., Inc.	1,150
Poel & Kelly, Inc.	687
Rogers Brown & Crocker Bros., Inc.	502
Charles T. Wilson Co., Inc.	551
SEPTEMBER 8. By "City of Derby," Far East.	
General Rubber Co.	470
Littlejohn & Co., Inc.	1,244
The Meyer & Brown Corp.	pkgs.
Poel & Kelly, Inc.	50
SEPTEMBER 8. By "Pine Hayes," Far East.	
H. A. Astlett & Co.	1,190
Baird Rubber & Trading Co., Inc.	1,430
General Rubber Co.	1,703
Haldane Bierrie & Co., Inc.	250
Hood Rubber Co.	pkgs.
Littlejohn & Co., Inc.	450
The Meyer & Brown Corp.	2,727
The Meyer & Brown Corp.	pkgs.
The Meyer & Brown Corp.	360
Poel & Kelly, Inc.	1,300
Raw Products Co.	635
Rogers Brown & Crocker Bros., Inc.	500
Charles T. Wilson Co., Inc.	1,080
SEPTEMBER 9. By "Fairfield City," Far East.	
H. A. Astlett & Co.	1,332
General Rubber Co.	8,482
Haldane Bierrie & Co., Inc.	155
Hood Rubber Co.	1,329
Littlejohn & Co., Inc.	645
The Meyer & Brown Corp.	pkgs.
H. Muehlstein & Co., Inc.	100
Poel & Kelly, Inc.	150
Raw Products Co.	30
Rogers Brown & Crocker Bros., Inc.	197
Charles T. Wilson Co., Inc.	790

SEPTEMBER 9. By "Makalla," Far East.	CASES
H. A. Astlett & Co.	56
General Rubber Co.	1,526
Haldane Bierrie & Co., Inc.	100
H. Muehlstein & Co., Inc.	280
SEPTEMBER 11. By "Wray Castle," Far East.	
H. A. Astlett & Co.	1,176
Baird Rubber & Trading Co., Inc.	300
General Rubber Co.	7,565
Haldane Bierrie & Co., Inc.	274
Hood Rubber Co.	1,138
Littlejohn & Co., Inc.	7,431
Meyer & Brown, Inc.	pkgs.
The Meyer & Brown Corp.	80
The Meyer & Brown Corp.	1,311
H. Muehlstein & Co., Inc.	410
Poel & Kelly, Inc.	393
Rogers Brown & Crocker Bros., Inc.	780
Charles T. Wilson Co., Inc.	4,066
SEPTEMBER 12. By "Carmania," Europe.	
General Rubber Co.	269
Charles T. Wilson Co., Inc.	85
SEPTEMBER 12. By "City of Cardiff," Far East.	
H. A. Astlett & Co.	2,335
Baird Rubber & Trading Co., Inc.	914
Paul Bertuch & Co., Inc.	100
General Rubber Co.	7,644
Haldane Bierrie & Co., Inc.	628
Littlejohn & Co., Inc.	4,291
The Meyer & Brown Corp.	pkgs.
H. Muehlstein & Co., Inc.	2,306
Poel & Kelly, Inc.	525
Raw Products Co.	173
Rogers Brown & Crocker Bros., Inc.	100
Rogers Brown & Crocker Bros., Inc.	1,693
Rogers Brown & Crocker Bros., Inc.	1,100
Charles T. Wilson Co., Inc.	1,137
SEPTEMBER 12. By "Minnekahda," London.	
Baird Rubber & Trading Co., Inc.	379
General Rubber Co.	112
Littlejohn & Co., Inc.	1,458
The Meyer & Brown Corp.	pkgs.
SEPTEMBER 12. By "Ryndam," Far East.	
General Rubber Co.	150
SEPTEMBER 12. By "Samaria," London.	
Baird Rubber & Trading Co., Inc.	53
SEPTEMBER 15. By "Clan Kemerth," Far East.	
H. A. Astlett & Co.	168
SEPTEMBER 15. By "Mahanada," Colombo.	
Hood Rubber Co.	bales
SEPTEMBER 15. By "Silverash," Far East.	
H. A. Astlett & Co.	1,002
Baird Rubber & Trading Co., Inc.	400
Baird Rubber & Trading Co., Inc.	1,350
Poel & Kelly, Inc.	390
SEPTEMBER 16. By "Pres. Lincoln," Far East.	
H. A. Astlett & Co.	50
Africans	
AUGUST 15. By "Samaria," Europe.	
Littlejohn & Co., Inc.	24
AUGUST 22. By "Paneras," Far East.	
General Rubber Co.	1
AUGUST 22. By "Sacandaga," Antwerp.	
Hood Rubber Co.	1889
Balata	
SEPTEMBER 9. By "City of Cardiff," Malaya.	
Paul Bertuch & Co., Inc.	25
Guayule	
AUGUST 22. By "Mexico," Mexico.	
Continental Rubber Co. of New York	1,620
AUGUST 30. By "Stal," Mexico.	
Continental Rubber Co. of New York	1,620
SEPTEMBER 6. By "Monterey," Mexico.	
Continental Rubber Co. of New York	2,740
SEPTEMBER 15. By "Tela," Mexico.	
Continental Rubber Co. of New York	1,620
Rubber Latex	
AUGUST 15. By "Atlanta City," Far East.	
General Rubber Co.	42,497
AUGUST 15. By "Titan," Far East.	
General Rubber Co.	20,837
SEPTEMBER 2. By "Lancaster Castle," Far East.	
General Rubber Co.	46,178
SEPTEMBER 9. By "Fairfield City," Far East.	
General Rubber Co.	71,397
Littlejohn & Co., Inc.	3,000
SEPTEMBER 12. By "Wray Castle," Far East.	
General Rubber Co.	41,652

GALLONS

## Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases		Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
AUGUST 16. By "Southern Cross," Bolivia.						General Rubber Co.	176	...	94	71	...
Paul Bertuch & Co., Inc. ....	*507	...	...	...	...	Littlejohn & Co., Inc.	314	...	...	...	...
AUGUST 22. By "Paneras," Brazil.						The Meyer & Brown Corp.	175	...	...	200	...
H. A. Astlett & Co. ....	577	...	120	66	...	SEPTEMBER 9. By "City of Cardiff," Malaya.					
Paul Bertuch & Co., Inc. ....	*771	...	141	...	...	Paul Bertuch & Co., Inc.	63	...	...	65	...
Paul Bertuch & Co., Inc. ....	73	...	...	...	...	SEPTEMBER 12. By "Polycarp," Brazil.					
General Rubber Co. ....	629	2	22	6	...	H. A. Astlett & Co. ....	97	...	75	182	...
Littlejohn & Co., Inc. ....	696	...	150	717	...	Littlejohn & Co., Inc.	53	...	...	...	...
The Meyer & Brown Corp. ....	1630	...	...	70	...	The Meyer & Brown Corp.	371	...	...	...	...
SEPTEMBER 5. By "Arden Hall," Brazil.											
H. A. Astlett & Co. ....	341	1	6	8	...						
Paul Bertuch & Co., Inc. ....	60	...	56	15	...						

\* Biscuits. † Bales. ‡ Pelles.

## United States Crude and Waste Rubber Imports for 1927 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total	Balata	Miscellaneous	Waste
January .....	42,646	2,378	269	299	144	...	1927 45,736	38,697	106	1,508
February .....	25,326	1,668	213	203	190	...	1926 34,067	119	935	953
March .....	33,114	1,176	206	253	329	...	35,078	82	674	531
April .....	45,843	1,822	351	229	418	10	48,673	109	1,317	631
May .....	33,735	1,872	197	399	364	2	36,569	30,411	68	1,075
June .....	31,444	1,057	123	351	317	2	33,194	30,107	85	1,092
July .....	37,060	871	46	388	295	7	38,667	37,087	66	1,030
August .....	31,195	986	29	504	345	9	33,068	25,969	25	882
Total, 8 months, 1927 .....	280,363	11,830	1,434	2,526	2,402	30	298,585	660	8,513	4,385
Total, 8 months, 1926 .....	254,945	8,515	2,172	3,332	2,703	26	271,693	321	7,452	4,282

Compiled from statistics supplied by the Rubber Association of America, Inc.

## Exports of Rubber, Caucho and Balata from the Amazons During First Six Months of 1927

EXPORTERS	EUROPE					Total	AMERICA					Grand Total
	Fine Kilos	Medium Kilos	Coarse Kilos	Caucho Kilos	Balata Kilos		Fine Kilos	Medium Kilos	Coarse Kilos	Caucho Kilos	Balata Kilos	
General Rubber Co. of Brazil—Para-Manaos	1,131,673	122,504	71,238	156,576	...	1,481,991	918,191	138,356	450,684	558,478	38,253	3,585,953
Berringer & Co.—Para-Manaos	692,949	111,014	128,898	218,014	173,535	1,324,410	557,211	68,189	142,725	857,991	78,356	3,028,882
Ranniger & Co.—Para-Manaos	499,676	17,218	69,970	62,059	113,000	761,923	692,974	55,420	158,509	85,685	...	1,754,511
J. G. Araujo & Co., Ltd.—Manaos	186,486	28,774	41,605	60,315	69,940	387,120	652,557	52,879	147,466	439,788	50,552	1,730,362
F. Chamie—Para-Manaos	13,560	...	...	...	...	13,560	612,280	4,870	531,580	58,350	79,480	1,286,560
Suarez Filho & Co.—Para-Manaos	479,631	...	210	...	...	479,841	339,787	...	89,139	123,209	...	1,031,976
Adelbert H. Alden, Ltd.—Para-Manaos	288,461	42,968	73,603	30,349	74,160	509,541	78,030	...	...	...	5,440	83,470
S. Bitar, Irmãos—Para-Manaos	214,161	2,727	59,793	23,196	...	299,877	149,678	4,924	43,840	40,034	2,459	240,935
Companhia Fluvial—Manaos	81,780	4,586	7,441	138,982	...	232,789	96,617	4,253	22,739	42,827	...	166,436
Suter, Baumann & Co.—Para-Manaos	164,327	19,583	20,107	33,569	58,480	296,066	...	1,120	...	10,080	9,380	20,580
Ferreira Costa & Co.—Para-Manaos	25,420	...	5,080	10,160	...	40,660	50,141	6,661	21,872	101,996	...	186,670
Teixeira & Co.—Para-Manaos	10,240	...	...	2,100	...	12,340	...	...	...	127,170	...	139,510
B. Levy & Co.—Manaos	42,245	10,670	5,982	11,805	15,960	86,662	10,560	...	...	10,560	15,200	36,420
Jos. Origet & Co.—Para-Manaos	31,003	1,282	1,286	61,957	...	95,528	...	...	...	...	...	95,528
Semper & Co.—Manaos	36,210	1,440	8,360	480	...	46,490	18,530	2,240	730	...	...	21,500
Amazon River St. Nav. Co. (1911) Ltd.—Para-Manaos	18,087	435	195	5,904	...	24,621	...	...	...	...	...	24,621
Hieson Jones & Co.—Manaos	...	...	...	...	...	...	82	...	1,925	...	16,886	18,893
I. S. Amorim	...	...	...	...	...	...	170	...	960	...	...	1,130
Sundry—Para-Manaos	8,500	...	...	...	8,831	17,331	29,907	...	7,000	...	16,234	53,141
Total from Para and Manaos	3,924,409	363,201	493,768	815,466	513,906	6,110,750	4,212,715	338,912	1,619,169	2,456,168	312,340	8,939,304
From Iquitos	17,019	6,631	2,916	9,417	449,468	485,451	35,877	61,111	15,033	16,399	193,502	321,922
Grand total from the Amazons	3,941,428	369,832	496,684	824,883	963,374	6,596,201	4,248,592	400,023	1,634,202	2,472,567	505,842	9,261,226

## Destinations

	From Para Kilos	From Manaos Kilos	From Iquitos Kilos	Total Kilos		From Para Kilos	From Manaos Kilos	From Iquitos Kilos	Total Kilos
United States	3,849,529	4,940,737	321,922	9,112,188	Spain	12,570	...	...	12,570
Germany	954,813	1,791,269	188,894	2,934,976	Italy	2,210	...	...	2,210
England	531,454	1,773,151	161,712	2,466,317					
France	667,774	166,648	134,845	969,267	Totals	6,298,953	8,751,101	807,373	15,857,427
Netherlands	154,731	56,130	...	210,861					
Brazil (South)	125,872	23,166	...	149,038					

Compiled by Berringer &amp; Co., Para, Brazil.

## CELTE IN RUBBER COMPOUNDS

The Celite Co. has established a fellowship at the Bureau of Standards to investigate the properties which the various grades of Celite impart to vulcanized compounded rubber.

Both the bureau and the Celite Co. have previously studied the use of various forms of diatomaceous silica as a filler in rubber

goods, but it is the purpose of the present fellowship to investigate the subject much more intensively than before and also to extend it to include the finest materials that can be made from diatomaceous silica by grinding in various types of mills and other means of disintegration.

